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THE STUDY OF HUMAN NUTRITION: THE OUTLOOK TO-DAY *

BY

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Among all the demands which the body makes on its environment that for its food is of outstanding importance, and it is to-day becoming well recognized that right nutrition, and especially right nutrition early in life, may profoundly affect the well-being and social value of the individual. Throughout all the earlier and most prolonged stages of his evolution man depended for guidance in the search for food, or later in its production, on instinct, aided by very slowly growing transmitted experience. He depended no less upon instinct and appetite for choice of the right food. What is perhaps remarkable is that the spirit of scientific inquiry had been active for two centuries before even the most civilized communities became provided with guidance of a more definite and reliable kind. The results of the experience obtained by successive generations had become more and more available because recorded, and social organization, of course, brought food to the doors of all who could afford it. But fundamentally the available guidance bearing on quantity and choice was scarcely different in kind from that possessed by primitive man or by primitive communities to-day.

Neglect and Disbelief

For many years after the scientific study of nutrition began in earnest in the middle of the last century its results had little influence on the lay mind. It progressed in an atmosphere of neglect and disbelief. The work of the scientific investigator is always under suspicion with the majority when it professes to throw new light on traditional or customary human activities. Apart from the natural reaction of the average citizen, even that of practical agriculturists, administrators, and a good many physicians, when first presented with scientific data concerning the production and utilization of foods, was to assert that they could be of no more than academic interest. The race, it was felt, had survived through the ages without such knowledge, and science could not improve practice to any significant extent. There are some, I think, who feel the same to-day. But mere survival of a race, however long, is no proof that the majority of its members have ever lived in optimal conditions, or have ever displayed to the full their innate capacities. It is easy to illustrate this from human history, and illustrations are available to-day.

It may be fairly said that not till the end of the eighteenth century did knowledge arise which was fated to be one of the foundation stones of modern nutritional science. I mean, of course, the proof by Lavoisier, by experiments which for that day were remarkably quantitative in kind, that the body burnt its food just as fuel is burnt, and that the oxygen consumed in the process, and therefore the materials oxidized, is directly proportional to the work done by the body. The great Frenchman showed how fully he understood the significance of this by commenting on the irony of the circumstance that those who labour the hardest are usually the least able to afford the food to support their labour. Lavoisier opened an entirely new era with study of nutrition—the era of quantitative experiment, and therefore the scientific era. We can indeed be fair to earlier students only by remembering that not until the fundamental sciences—chemistry, physics, and biology, and especially the first—were sufficiently advanced could our present quantitative conceptions of metabolism possibly originate.

Unfortunately the profound significance of Lavoisier's results became little known or understood for many years afterwards by those responsible for the feeding of communities, a circumstance that I will later illustrate. It was, indeed, many years before further scientific knowledge was built upon the foundation stone of Lavoisier's teaching.

Liebig's Nutritional Studies

The nutritional studies of Liebig began about 1840. Liebig's results, and the doctrine he built upon them, are doubtless familiar to many present, but I always feel it profitable to take Liebig's views, which involved the first theory of nutrition, as a base line from which to measure the extent of modern progress. Liebig was one of the founders of organic chemistry, and no less a pioneer in its application to the plant and animal. He was well aware that the prime necessities in animal nutrition are the three proximate foodstuffs—proteins, fats, and carbohydrates—provided by the synthetic activities of the vegetable kingdom. Nothing was known then of the essential nature of proteins, though they were recognized as being the carriers of nitrogen and essential constituents of all living tissues. Liebig, who had himself developed the methods of organic analysis, found that the percentage composition of proteins from various sources was essentially the same. His view, therefore—differing greatly from our own—was that the proteins of food when eaten are easily, directly, and almost unchanged, built up into the tissues of the consumer.

His doctrine made a sharp and simple distinction between the fate of proteins in the body and that of the other foodstuffs. Their paths, he taught, do not meet. The fats and carbohydrates, he held, have no share in true vital activities. They remain, as it were, dead stores of fuel, to be burnt uncontrolled on the arrival of oxygen from the lungs, being used to supply heat, and heat alone. His mind, moreover, was obsessed by a further consequential idea which for a time led to a grave

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error in contemporary conceptions concerning the functions of foodstuffs. He believed that protein once built into living tissue, unlike fat and carbohydrate, can suffer no change except when that tissue is vitally functioning. He held, for example, that proteins of muscle are locked up in its fibres and break down only when the muscle contracts; yet Liebig believed that it is this associated breakdown of protein which supports the power of contraction. If this seems confusing it should be remembered that our clear present conceptions of energy and energy exchanges were not available for Liebig's thought. The practical conclusion from his theory was that protein, and protein alone among the foodstuffs, is able to support muscular activity. Liebig's authority made this belief long current. He held, further, that though protein as protein is never oxidized to serve directly as a source of heat, the products of its breakdown can subserve that function. This he felt to be a necessary assumption to explain heat production in the bodies of carnivora, so large is the proportion of protein in their food. Liebig was a great experimentalist, but his theory of nutrition was not based upon experiment. Yet we know now that controlled experiment is as essential for the progress of nutritional as of all other branches of science.

The Balance Sheet of the Human Body

Between the days of Liebig and the close of the century much good work was done on nutritional problems, though by relatively few investigators, at first chiefly in Germany, but later also in the United States. By studying what may be called the balance sheet of the human body, and by observing what conditions are necessary to encourage gain or prevent loss, the cruder needs of the body became accurately known. In particular, more and more attention during this period was given to the quantitative needs of the individual for a supply of energy in his food. It had become well recognized that all three of the main foods—proteins, fats, and carbohydrates alike—can supply energy for muscular work, and much was done in the endeavour to decide in what proportions these foodstuffs are best supplied. Finally, towards the end of the century, the experimental study of energy demands assumed extreme accuracy. The human calorimeter of Atwater and Rose was the product of many years' labour, the cost of its production being borne by the United States Government. It reached technical perfection, and by its use Atwater and Benedict were able to measure the calories utilized by individuals upon a great variety of diets, in the resting state or doing measured work for stated periods.

The general public when it hears of apparent differences of opinion among experts concerning the number of calories which should be contained in adequate dietaries cannot be supposed to know how great is the amount of accumulated knowledge concerning this question. The trouble, of course, is to apply it amid the differences displayed by human beings, not only in respect of age, sex, and bodily constitution, but still more in the great variation in the mechanical work which individuals are called upon to perform. In the literature of the subject are the results of scores of statistical studies from many countries concerning the energy value of the food actually eaten by communities of various types. Many of these records go back for half a century; many fresh studies are being published to-day. They deal with every kind of community—industrial and others. I have recently been allowed to see one, as yet unpublished, relating to the food consumption of an enclosed monastery. Any pretence to arrive at a real average value from this mass of data has little scientific justification. Nevertheless, it is sometimes necessary for administrative guidance to estimate so far as is possible the approximate needs of individual units in a community. Anyone who studies the available data as a whole cannot, I think, fail to believe that they point convincingly to a mean demand for 3,000 calories a day.

But this convenient and commonly accepted figure (so easy to remember) can properly be applied only to mixed communities large enough for the wider variations to cancel out. In such cases the figure is both justifiable and useful. When, however, the attempt is made to estimate the family needs in a particular class—the labouring class, for instance—in which the work of the bread-winner varies so much, I think any estimate should allow a margin for safety. We are obliged for the purpose of such estimates to produce a figure per unit of population, though the needs of a man, a woman, and children of different ages are so different. To get over this difficulty it is customary to treat the needs of the woman and child as being represented by a certain fraction of the man's needs, and then to convert them by the use of factors into "man values." But the estimations so made have no very sound basis, and for this reason again a margin in the estimate should be provided. I have personally no quarrel with the 3,400 calories which were suggested by a committee of the British Medical Association. I think myself there are good reasons why this figure should also apply to the unemployed.

Although a supply of potential energy in his food proportionate to the internal and external work done by the body is a prime need of every individual, the precise nature of the substances in which that energy is supplied is all-important. The material needs of the body are numerous and highly specific in kind. This is the essence of modern teaching. I will ask you, then, to appraise the sources and the value of our present knowledge concerning these specific materials, which we now know to be necessary for adequate nutrition.

The Proteins

At the very end of the last century illuminating facts concerning the nature of proteins first came to hand, but so complex are these substances that knowledge, won by the labours of very many, has continued to grow ever since, and, on new lines, it is growing fast to-day. Protein molecules compared with those of substances more commonly studied by the organic chemist are large and complex. The molecular weights of some of them are of the order of 30,000, those of others reach 60,000. In the tissues of living organisms many distinct proteins have their place. But these heavy protein molecules have one property related to the peculiar and all-important part they play in the phenomena of life. It is a property which has made one aspect of their behaviour relatively easy to study, and our knowledge of it has illuminated our understanding of nutrition. Every protein when under simple treatment in the laboratory, but also, and more important for our understanding of nutritional functions, when submitted to the processes of digestion, breaks down into rather more than a score of relatively simple substances: the isolated building stones, as it were, from which the original complex structure is constructed. These substances all belong to one chemical genus, that of the α amino-acids, but each is a species within that genus, displaying its own individual properties. Identical amino-acids are constituents of every protein, whether of animal or of vegetable origin, but any one protein differs from all others in that the actual grouping of these constituents in its molecules is peculiar to itself. One protein may further differ from any other in that their respective molecules contain the various constituent amino-acids in differing relative proportions, while, again, a few proteins entirely lack certain of the typical constituents. Thus, though the constituent units of all are the same, each of

these important substances is characterized by a special molecular pattern, and the protein patterns of our tissues may differ widely from those we consume in our food. In the intestine, however, the latter are broken down into their constituent units. When they are thence absorbed they reassemble under the influence of subtle directive agencies into new patterns, those proper to the proteins of the living tissues of the consumer. I have ventured upon these considerations because they lead to a conclusion with practical bearings which is prominent in the teaching of to-day. We hear much of the "biological value" of proteins; of "first-class proteins" as necessary for satisfactory diets. I would like to explain for those who may not have grasped it the meaning of this term. You are probably familiar with what is known as "the law of the minimum," as applied by Liebig to the nutrition and the growth of plants and animals. If any one substance quite essential to growth is supplied in amount which, relative to the demand for it, is minimal, that substance becomes a limiting factor for growth rate and for the value of a diet, no matter how much of other essentials many be supplied. This assumes, of course, that the living and growing parts of the organism always maintain a constant composition, and in respect of the tissue proteins of the animal body this is essentially true. The pattern of its tissue proteins is a constant characteristic of each species of animal. It is an aspect of that chemical specificity which underlies morphological specificity.

The food proteins which can be used with the greatest economy in the body are those which contain all the essential amino-acids in such relative proportions as will correspond most nearly with the proportions required by the living tissues of the consumer. These are the proteins of so-called high biological value; they are the "first-class proteins" which nowadays, as I have said, receive mention whenever diets are evaluated. That different proteins have different values in this sense has been abundantly proved by controlled experiments on animals and to a less extent by experiments on human beings. It will be easily understood that it is animal proteins which, in general, have the highest value. It was long accepted that a man doing average work required a daily ration of 100 grams of protein. More recently we have come to believe that this figure is too high. I can testify as a result of experiments in practical classes, involving estimations of the daily excretions of nitrogen, that the average consumption of Cambridge undergraduates (those in training doubtless excepted) is not above some 80 grams. But in this the proportion of first-class protein is probably higher than the average.

Carbohydrates and Fats

In speaking now of the nutritional functions of carbohydrates and fats I will make less demands on your attention. Liebig viewed them indifferently as so much fuel to be burnt, and until the early years of this century it was widely believed that in a dietary any of the fat present could be replaced by carbohydrate of equal fuel value (or vice versa) without affecting the essential adequacy of that dietary. We know now, however, that each class among the foodstuffs has functions peculiar to itself. The changes they undergo in the body do not follow independent paths; the paths cross and the changes are interlocked. Fats cannot be properly utilized in the absence of carbohydrates. Animal experiments, at least, suggest that, even for normal growth, special forms of fat (the highly unsaturated fats) must be present in the food, and an actual deficiency disease has been recognized in animals as resulting from fat starvation. We are fully justified in believing that an ideal dietary should contain fats and carbohydrates in some due proportion.

Dynamic Equilibrium of Tissue Units

Such facts illustrate the complex needs of nutrition and emphasize the circumstance that chemical events in living tissues proceed not independently, but each as part of a whole; each in direct or indirect relations with all others. No one, indeed, who has given thought to the matter can fail to understand that the chemical events of which every living tissue is the seat must themselves be very complex. In the course of growth or repair heterogeneous food materials are converted by controlled processes of reconstruction into the highly specific material of which each tissue is composed; while the intrinsic activities of every tissue are based upon ordered and sustained progress among a great variety of chemical events. Each tissue unit, each living cell, is a system which, though the seat of innumerable such events, retains, nevertheless, an essential individuality. It displays a condition of dynamic equilibrium which, even when disturbed, tends always to return to a normal mean. It follows that each individual chemical reaction within it must progress in close relation, direct or indirect, with all the other reactions. All reactions must be adjusted with due regard to their nature, direction, and velocity, and, being thus organized, they support the living cell as a dynamic but self-consistent unit. In its organization new materials derived from the food ultimately, if not immediately, find their place, and products of change leave the system; but the actual living material retains its essential chemical identity. Among the chemical events of life organization reigns supreme; it is their outstanding character.

The condition of equilibrium within a living unit which results from such high organization is, as would be expected, highly sensitive to certain forms of disturbance from without. As the equilibrium within the cell is shared by chemical molecules of a highly specific kind, each displaying properties due to its own special structure, it is not surprising that the intrusion of molecules foreign to the cell may create grave disturbances. The entry of a few molecules of a powerful poison, for instance, into the cells of this or that tissue may produce irreversible and fatal disturbances of equilibrium. The ability to produce noteworthy effects is, however, by no means possessed by all foreign molecules. There must be always some special structural aspect to make a molecule "biologically active," and this also determines the nature of its activity.

We have long known that there are molecules which, though they must be supplied from without, are not in the above sense foreign to tissue cells, but, on the contrary, are absolutely necessary for their normal activity. In the animal body such molecules are those of substances not made in the tissues generally, but always locally in special organs, from which a supply is distributed to other organs through the circulation. I allude, of course, to the substances contained in so-called internal secretions, which cannot fail to be familiar to you under the name of "hormones." They are now known to be very numerous, exerting many diverse functions. Each one is a quite specific chemical substance with its own indispensable functions in the body, and extremely small amounts are characteristically required for the fulfilment of those functions. The exact chemical nature of several of these hormones is to-day accurately known.

The Vitamins

Some twenty years ago, however, the realization came that the economy of the animal body calls for the activities of substances with functions apparently akin, in many respects at least, to those of the hormones, which the body itself is nevertheless unable to produce, and therefore must receive them in its food. The indispensable functions of these, like those of the hormones,

are adequately fulfilled by extraordinarily small amounts of each one. These food constituents yield, therefore, no appreciable supply of energy, nor do they serve in any ordinary sense as structural materials. Their presence, like that of the hormones, is necessary rather for the normal progress of active events. They have dynamic functions. I am alluding, of course, to the vitamins.

It is an interesting, if at present a puzzling, circumstance that evolution should have left the animal dependent upon its environment for certain of these essential substances in the vitamins, while endowing it with the power of producing others for itself—the hormones. It is noteworthy that certain animals can produce in their own organs some particular vitamin for a supply of which others depend upon their food. In the former case, were vitamins otherwise unknown, the one in question would have been thought of as a hormone.

The activity of research upon the nature, distribution, and functions of vitamins has to-day become intense. The number of papers published describing original work in the field has recently reached a total of approximately a thousand in a single year, or nearly three a day! Whole books have been devoted to single individuals among them. This is another instance of the immense attention which is now being given to nutritional studies. I would, indeed, ask you to regard this circumstance as one of the themes of my lecture. The voluminous nature of the literature devoted to vitamins is disconcerting for one who wishes to summarize what is to-day known about them, or to estimate the outlook their study now presents. Here I must deal with them in a very general way. I must refrain from following up that gradual accumulation of evidence which led first of all to the discovery that substances of the kind are necessary, and later to a realization of their multiplicity and to our growing knowledge of their functions. I think I may assume that you are not unfamiliar with the general nature of that evidence. It began with discriminative feeding experiments on animals, and the results of these became soon linked up with evidence from the study of so-called deficiency disease displayed in human communities. In some of the latter the absence of a vitamin from food is the essential aetiological factor, or at least an essential link, in the chain of their causation. The traditional custom of labelling each vitamin with a letter of the alphabet has proved convenient enough, but will probably not long survive now that our knowledge of their actual chemical nature is fast growing.

Vitamin A

Early in the history of these substances it was recognized that a factor first observed in loose association with animal fats is essential for the growth of young animals, and that in its absence animals and human beings alike display unmistakable pathological symptoms. We know to-day that these symptoms arise primarily from degenerative changes in the epithelial cells which line the exposed surfaces of the body; those of the intestinal mucous membrane, for instance, the skin itself, and perhaps those which line the air spaces of the lungs. Among notable effects of any serious deficiency in a supply of vitamin A to the human body is the serious eye trouble now known as xerophthalmia. This is very common in the East, and by no means unknown in Europe. Most cases are cured by administration of the vitamin. It is remarkable that the condition known as night-blindness may follow from a lack of it, because it is necessary for the formation of visual purple in the retina. Its functions in the body, moreover, are of more general importance than these illustrations may suggest.

Recent studies have established the fact that vitamin A is chemically closely related to a group of vegetable pigments known as the carotenes, and that when these pigments are contained in the food, although they themselves have no specific influence on nutrition, they are converted by the agency of the liver into the vitamin. Apart from its chemical interest, this circumstance has great practical importance, since green vegetables contain carotenes. Indirectly, therefore, they form an economical source of this necessary nutrient.

Vitamin A is among the vitamins which chemical skill has recently isolated in a pure condition, and its actual constitution is now known. Unlike certain others which are crystalline substances, it is, when pure, a yellow oil so potent in its action that 0.005 milligram, about one ten-thousandth of a grain) represents the daily needs of a rat, and one five-hundredth of a grain probably suffices for a human being.

In the early days of vitamin research one with functions essential for the maintenance of normality in the nervous system was recognized and labelled B. But preparations of which the observed activity was supposed to be due to this alone have proved to contain other potent vitamins, and we now have to speak of the "B complex." I will return later to a consideration of this.

Vitamin C: Ascorbic Acid

Vitamin C is now familiar as the preventive of scurvy, a disease which is still a scourge in some of the world's communities, while a terror to those who voyaged long without a supply of fresh foodstuffs. This vitamin has now been obtained pure in the form of a white crystalline substance, of which the constitution is known, and the necessary daily supply for a small animal is some 3 milligrams, or one-twentieth of a grain. The vitamin is specially, but not exclusively, concerned with maintaining the normal nutrition of the smaller blood vessels. The haemorrhages which are characteristic of scurvy are due to the degeneration of these.

It is extremely interesting to realize that a substance able to exert such specialized functions should be—as it is—quite closely related to substances which are themselves ordinary foodstuffs; to the simpler carbohydrates; to the sugars. I would have you note, too, as illustrating the close relationship between the molecular architecture of a substance and its power to display this or that special physiology actively, that when the spatial arrangement of the H and OH groups which are attached to the carbon chain is only slightly different, an otherwise identical substance possesses none of the vitamin's activities. Vitamin C will henceforth carry the alternative name of ascorbic acid. Much interesting work has been done upon this vitamin of late, but I must not dwell upon it.

Vitamins D and E

The presence of vitamin D in the body is essential for proper dealings with calcium, and unless it is present in adequate amount in the food of a growing child, or, alternatively, is produced from an inactive precursor in the body by irradiation (surely a most interesting alternative), the condition of rickets becomes established. Its presence, moreover, is one of the factors necessary for normal dentition. The essential molecular structure of this vitamin has been determined. The vitamin belongs to a class of substances known as sterols, and it is interesting, if we take the view I have already adumbrated that vitamins are exogenous hormones, that this structure in a modified form is shared by a prominent member of the latter class.

In vitamin E we have a substance of which the influence seems necessary for normal development and functioning of the organs of generation—in the male for the development of the testis, in the female for the proper functioning of the placenta. It has been called the "anti-sterility"

vitamin, a term which carries implications of too great specificity. Deficiency of vitamin A, for instance, will ultimately lead to a failure in reproductive powers. The special influence of vitamin E, however, has been abundantly proved in animal experiments, and recent reports from clinics have suggested that its administration may prevent the tendency to habitual abortion which is sometimes displayed by women. The chemical nature of vitamin E has not yet been determined.

The Vitamin B Complex

I will now make such brief reference to the B complex as time will allow. There is, to say the truth, no logical but only a historical reason for grouping these vitamins together. That one of the group which is needed for the proper maintenance of nerve tissues is now known as B_1. The recognition alike of its existence and the special sphere of its functions came, not from experimental studies alone, but from the proof that its absence from certain dietaries is the prime, though it would seem not the sole, factor in the causation of beri-beri, a disease in which nerve degenerations are a prominent feature. Much labour has been spent in the endeavour to prepare this vitamin in a pure state, and we now know its empirical chemical formula with some certainty, though its structural formula is not yet determined. Unlike other known vitamins it contains the element sulphur in its molecule.

The use of the pure B_1 vitamin in animal-feeding experiments has shown that though it serves all the functions originally attributed to it in the preparations which in earlier experiments served for its supply, it must have been associated with other vitamins. These preparations were also supplying their unsuspected needs. They contained, for instance, what for a time we knew as vitamin B_2 ; but the most recent studies have shown that B_2 itself consists of two factors. When one of these is absent from the food growth is not normal, and in the absence of the other an animal develops severe symptoms which resemble those of human pellagra. Very interesting knowledge concerning the former factor has now arrived. Just as vitamin A is related to one group of natural pigments, the carotenes, so is the growth factor of B_2 related to the flavines. These latter are yellow fluorescent pigments, somewhat widely distributed in nature. In very small amount a flavine is present in milk. Brilliant synthetic studies just carried out at Heidelberg have decided the structure of this, and the biological evidence seems to prove that it is the actual growth-promoting factor of the B_2 complex.

Once again we find a condensed ring structure ; this time in association with the carbon chain of a sugar. When given to a young rat which has ceased to grow from lack of it normal growth is induced by 0.015 milligram a day, or by about one five-thousandth of a grain. The name B_2 will probably be allotted to this substance, and another will go to the factor which prevents the development of the grave pellagra-like symptoms in experimental animals. To this latter I must spare no more than a reference, though it is of great importance. Though the aetiology of pellagra in human beings has aspects yet obscure, there is no doubt that a diet deficiency plays an important part in it, and remarkable cures by administration of preparations containing this B_2 factor have been reported of late. Pellagra in South America is a widespread and fatal disease, and even in Europe it not infrequently appears as the result of inadequate institutional feeding.

The proof that yet other factors of the vitamin type are necessary for complete nutrition seems imminent, but with these I cannot deal. The complexities in these nutritional needs, brought to light by experimental studies, are disconcerting, but must be faced. I would here emphasize the enormous advantage to these studies which accrues from the determination of the actual chemical nature of vitamins. This is giving greater objectivity to the facts won, and in the not too distant future it will help us to discover how and why these substances, so powerful in such minute amounts, intrude into and, like the hormones, control, each in its own way, the subtle chemical processes in living tissues.

I have perhaps over-emphasized the association of vitamin deficiencies with actual diseases. It cannot be made too clear that even a relative deficiency in any one of them may be the cause of subnormal health, and if long continued in infancy or youth may do permanent harm.

It is always desirable that the necessary supply of vitamins should be consumed in natural foods, but the increasing availability of reliable commercial concentrates, and especially of the pure substances, is fortunate. The use of these as therapeutic agents has grown rapidly abroad, though less rapidly in this country. Many reports come to hand, recording sometimes, though not always, even startling successes in their employment. Some time must elapse before the merits and limitations of vitamin therapy will become fully known.

Mineral Requirements

Studies of the mineral needs of the body have been proportionately not less active during recent years than those concerned as the organic nutrients ; and these needs prove to be no less important and scarcely less various than those for the latter. There is an analogy, too, between the two classes in that among the minerals relatively large amounts of some are required for what we may call structural purposes (though, of course, much less than of the organic structural foodstuffs), while of others, though they are actual needs, very minute amounts only are required ; these are concerned with the stimulation of active processes in the tissues. Thus, a deficiency in lime or phosphorus, of which relatively large amounts are required, may in practice prove to be a limiting factor in the adequacy of a diet, especially in the diet of a growing child. A certain minimum of other elements, such as magnesium and iron, is necessary, and it would seem that a supply of manganese and copper, and possibly of other metals, in minute amounts is also an essential ; but adequate amounts of these are usually present in the materials of any average mixed dietary. Characteristic of the body's demands for minerals is the circumstance that in certain cases at least the minimal need for some one element bears a definite proportion to the minimal need for some other. Having thus emphasized the importance of the mineral constituents of food, and also the great activity of present studies in this field, I must say no more concerning them.

Controlled Feeding Experiments

It is clear that the nutritional needs of the body when experimentally analysed prove to be unexpectedly complex. Whatever degree of practical guidance such analysis may prove in its totality to possess, it is yielding knowledge that we should surely wish to possess. I would ask you to agree that it could only have been obtained by means of fully controlled experiments. The first suggestion, and the complete proof that a particular substance is requisite for proper nutrition, comes when with that substance being present in the food of one community and absent from that of another the issue is carefully observed. If its presence or absence is made strictly the one and only difference between the diets we shall have the results of a fully controlled experiment. In general, such complete control can only be obtained in animal experiments, and during recent years a great crowd

of workers has been engaged in pursuing them. The greater number have been carried out on that extremely convenient animal, the rat. The breeding of rats for such experiments has become a profitable industry! Their use, believe me, has been abundantly justified. Without them much of our present knowledge would have been very difficult to win. But all-important as animal experiments are, we cannot ultimately rely on them alone, nor can we wholly rely upon mere observation when we come to transfer the results to human beings. In so far as they are possible, we must perform experiments on man.

Admirable experiments, properly controlled in the sense just mentioned, have been successfully made on human subjects. I will instance that carried out for the Medical Research Council by Corry Mann. The effect of adding a daily pint of milk to the accustomed dietary of a boys' home was observed for at least one year. The results were striking enough. The boys who remained upon the basic diet which, judged by ordinary standards, was adequate, gained on the average only 3.85 lb. during the year and showed an average growth of 1.84 inches. Those taking the milk in addition gained little short of 7 lb. each and their average increase of height was 2.63 inches. The betterment in general health was obvious to unprejudiced eyes. Very fully controlled again were Dr. May Mellanby's large-scale experiments on children at Sheffield and Birmingham, proving statistically the benefit of adding vitamin D to the diet as a preventive of dental caries. Scientifically controlled again were the experiments of Dr. Edward Mellanby, showing the influence of vitamin A in decreasing the liability to certain infections.

There is no question that the position of nutritional studies at the moment calls urgently for further experimental research on human material in controlled conditions. This is necessary for putting our present knowledge on the soundest possible basis and for advancing it on desirable lines. The results of such experiments, moreover, are more apt to bring conviction to the majority than those done on animals. They call, however, for much organization, and they need to be prolonged. They therefore need considerable financial support.

I have claimed that animal experiments have proved to be necessary for the first detection of the subtler nutritional needs, and often for the strict proof of suggestions which arise from observation. Owing to the justifiable concentration in such experiments on individual nutritional factors, they are apt to neglect the circumstance that there may be, and commonly is, complexity in the causation of nutritional failures as displayed by mankind.

I will illustrate what I mean by reference to the functions of vitamin A. You have heard that its influence on the integrity of epithelial surfaces has been chiefly emphasized, and rightly so. Vitamin D, on the other hand, has received much attention as contributing to the normal processes of dentition; again rightly so. But evidence has recently arrived to suggest that A also plays a part in dentition; as, in parenthesis, also does C. Doubtless these different vitamins influence different processes involved in the complex growth of a tooth. Again, for the normal maintenance of skin nutrition we have heard much of the importance of the special factor in the B_2 complex, but it would seem that the influence of A is scarcely less important here. Yet again: we have for years attributed beri-beri to the absence of B_1 alone, and to judge from the original evidence on which this assumption was made it can hardly fail to be an important factor in the aetiology of that condition. But Dr. Edward Mellanby has recently called attention to the fact that the nature of the nerve degeneration in beri-beri differs in detail from that shown in B_1-deficient animals, and he brings evidence to suggest that a deficiency in A is also a factor of importance in the causation of beri-beri. Once more, although vitamin E has such specific relations with the organs of generation, yet loss of fertility also follows prolonged absence of A from the food. It is quite possible that each vitamin possesses, nevertheless, a strict specificity in its action, but the causation of a pathological phenomenon as observed may well be complex.

Labour has been well spent in the analysis of nutritional needs, by demonstrating the nature and multiplicity of the individual factors concerned. These labours must still continue. Yet such is the nature of the body as a whole that we must at the same time endeavour to view nutrition from some unitary standpoint. Every factor in a dietary exercises its functions in union with those of others, and we have yet to learn with more exactness what should be the balance among them in an ideal dietary.

So large is the field I have endeavoured to cover that my survey has inevitably been superficial, but I have at least reminded you of the complexity of nutritional needs as revealed by scientific research during the last two decades. Nearly forty individual substances, it would seem, must be present in a food supply to make it completely adequate.

Practical Applications

But if now we turn to appraise the practical value of this knowledge, complexity after all gives way to relative simplicity. Sir Walter Fletcher once remarked that, whereas in the applications of physical science theory usually had a long start on practice, because many steps involving inventive ingenuity usually intervene, in biological science, and certainly in nutritional science, significant practical applications prove possible, even when theoretical knowledge lags behind. Twenty years ago, for instance, it became easy to correct the then current belief that calories and protein are the sole criteria of adequacy in diet, though we had little knowledge of the actual nature of vitamins or of other specific factors.

It is sure that if enough of natural foods in the right combination are available for the individual he need be in no danger of suffering from any form of malnutrition. Indeed, much of the teaching of modern research may be summed up in statements so simple that our elaborate scientific efforts may to some minds seem to have been superfluous. To convey the essentials of to-day's scientific teaching we have only to insist that fresh green vegetables and fruits are not luxuries but necessities, and that cereal foodstuffs, and especially cereals artificially fractionated, must not so dominate a diet as to exclude an adequate supply of fresh animal products; if not of flesh, then of the products of the dairy. Here we have, one might say, five-sixths of the gospel of right nutrition stated, doubtless, in terms which are too general for complete guidance. Yet a quarter of a century ago official scientific teaching laid no emphasis on the essential points involved, and mistakes in public policy have followed upon ignorance of these. Ordinary experience, even of intelligent men, does not endow them with sufficient knowledge to decide upon such matters. I may illustrate this by two instances, one old and one very recent.

The first was an occurrence in Millbank at the beginning of the last century. The officers of this penitentiary, partly for economic reasons and partly it may be for reasons of discipline, determined to try an experiment in nutrition. The already very inadequate diet of the institution was therefore ruthlessly cut down, though many of the prisoners were engaged in hard labour. The results were complete loss of muscular strength, rampant scurvy, and ultimately the death of thirty persons, rightly followed by indignation on the part of a British jury. This was in the days of complete ignorance as to the nature and quality of individual foods, but Lavoisier had already shown that the body must have fuel proportionate to the work required of it, a fact by no means appreciated by otherwise intelligent officials.

The second instance is of a different kind. A short time ago the island Nauru in the Pacific suffered from a most alarming outbreak of beri-beri, especially of infantile beri-beri. The able medical officer of the island, Dr. Bray, soon arrived, however, at the cause of this. The officials in charge of the island had first of all encouraged the consumption of milled cereals, and then forbade the consumption of the intoxicating national drink—"toddy"—made from fermented sweet swathe of the coco-nut. But removal of the husk from native grains had made toddy the sole source of vitamin B_1 in the food of the inhabitants; hence the disaster. Timely dietary reform soon arrested the outbreak.

Similar instances would not be difficult to quote: war-time provided not a few. It is dangerous for authority to control food policy in ignorance.

I will return for a moment to the use of cereals in diets. It is a familiar circumstance that the economic factor controls the relative amounts in which they are consumed. Bread is by far the cheapest of foods, and with falling spending power it tends always to increase as a constituent of family diets. Cereals, indeed, can never lose their great importance as foods, but to-day we realize that the qualitative deficiencies they undoubtedly present, together, apparently, with certain positive faults, must be corrected by supplying in adequate proportion the more expensive foods which can correct these errors. Economic policy must inevitably be adjusted to meet such facts.

Needs of the Growing Body

You will not expect me in a lecture such as this to discuss the right constitution of practical dietaries. Guidance concerning them is now easily available. It is time, however, that I should refer to the circumstance that the facts under discussion acquire their greatest significance when the well-being of infants, growing children, and adolescents is in question. The growing body has more urgent need for first-class proteins, vitamins, calcium, phosphates, etc., than has the adult body, and suffers when supplied with these over-cerealized dietaries which are deficient in these. Thinking of the special needs of the young raises at once the question of the national milk supply: its production and distribution and its purity. Apart from its necessary and obvious functions in infant feeding, there is abundant evidence, not of the vaguer sort but based upon sound experiment and observation, that milk is an exceptionally valuable food during the whole period of growth. It would seem, indeed, that, apart from merits which would be expected from its known constituents, its high quality proteins, its richness in lime and phosphorus, and its (less abundant) vitamins, milk must possess some subtle qualities—perhaps due to some special association among the constituents—as a food-supporting growth. I do not pretend this is scientifically proved, but there is certainly much evidence to suggest it.

The Value of Milk

The merits of milk were clearly displayed in the Woodford experiment already mentioned. Experiments, not so perfectly controlled but very convincing, have been conducted in Scotland, the United States, New Zealand, and Japan, and lately on a smaller scale in many other centres. The admitted beneficial effect of a milk ration upon Japanese children is very interesting, as so little is normally consumed in that country. Not a few writers, face to face with the malnutrition of certain classes of the population in China and Japan, have attributed it in part at least to the absence of an adequate supply of milk. Our educational authorities have fully recognized the value of giving extra milk to school children. Four years ago the practice was extended, and recently, owing to Government action, still more is reaching the schools. It is to be hoped, amid the great attention now being given to milk production, milk prices, and milk purity, that inquiries should extend to the question whether the existing methods of its distribution to the general public are the best possible. On the much-discussed question of the merits and possible demerits of pasteurization I will only say this: I have myself had reason to review the voluminous literature which bears upon this matter, and somewhat against my preconceptions I have come to the belief that pasteurization, when properly carried out (an important reservation), affects the nutritional value of milk to no more than a negligible degree. This was recently the conclusion of an expert committee of which I had the honour to be chairman. Nevertheless, I am sure that it is sound policy to encourage the practice of giving orange juice or its equivalent to all milk-fed infants to increase its antiscorbutic power, and further, that during our sunless winter small amounts of cod-liver oil should be given as a source of extra vitamins A and D.

The composition and qualities of milk, representing as they do Nature's own effort to provide a food complete in itself, support the modern claims concerning the complexity of nutritional needs. Of the many factors that recent research has revealed as essential, all or nearly all are contained in it. Its qualities are doubtless specially adjusted to the period of growth, but growth does not cease with infancy. In later periods milk can only constitute a portion of the diet, but it adds something of quite special value. It seems, indeed, that this brief reference to this (nearly) perfect food may logically close my discussion of the factors necessary for complete nutrition.

Knowledge yet to Come

There can be no doubt that a general and intelligent application of existing knowledge would lead to betterment in the health of the nation, and, as I have claimed, the guidance it offers can be simply applied. This, however, is not to say that our knowledge is complete. This is far from being the case. As I have hinted, we do not yet know the optimum intake of calories for children of different ages; our data for determining the needs for first-class protein in various circumstances are vague, and this is a matter of economic importance. Moreover, in the case of human beings, the optimum supply of individual vitamins is still uncertain. We do not know what beneficial modifications of a dietary may be desirable at special periods of life, as at puberty, for instance, or in the case of a pregnant woman. These are merely instances of knowledge yet to come.

Nine public lectures, on "Health and the Law," arranged by the Jewish Health Organization of Great Britain, are to be given, at 8.30 p.m., on Saturday evenings, from March 30th, at the Whitechapel Art Gallery, High Street, Whitechapel, E.1. These and subsequent lectures will deal in a popular way with various aspects of personal hygiene, and will also aim at describing the legal or administrative position of the principal public health services, with a view to a fuller appreciation of their value. The opening lecture, on March 30th, will be a general survey, by Professor W. W. Jameson, of public health in England during the past hundred years. Dr. Maitland Radford will lecture on the control of food supplies; Dr. Hugh Gainsborough, on the essentials of normal nutrition; Dr. J. D. Rolleston, on the prevention of infectious diseases; Mr. H. Lesser, on health insurance and pensions; Dr. L. Mandel, on preventable diseases in infancy and childhood; Dr. C. S. Myers, on the prevention of accidents; and Professor J. F. Browne, on maternal mortality. Particulars of the lecture to be held on April 20th, in association with the People's League of Health, will be announced later. The lectures are open to all free of charge.

PROSTATECTOMY

AS PERFORMED BY THE LATE PROFESSOR ANDREW FULLERTON

BY

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The following is a report of thirty-one consecutive cases of prostatectomy performed by the late Professor Andrew Fullerton, C.B., C.M.G., M.D., M.Ch., F.R.C.S.I., F.A.C.S., at the Royal Victoria Hospital, Belfast, from July, 1931, till August, 1933, when he retired from the honorary staff of the Hospital. During this period he used the technique, especially post-operative, which his previous experience of the operation had convinced him was, from its very simplicity, the best and safest of the numerous methods he had tried. Professor Fullerton intended to publish this series himself. He discussed with me the various points in the technique which he wished to emphasize, and briefly outlined his ideas for the form of this paper. Unfortunately he was not able to carry out his intention personally. I shall try to follow his original ideas as closely as possible, and for the sake of simplicity I shall write in the first person plural.

The cases were not selected for operation with a view to statistical records. The majority were brought into hospital from the waiting list, and the remainder were admitted as emergency cases with acute retention.

Pre-operative Treatment

Prior to operation the blood urea and Calvert's range of urea concentration were ascertained. A blood urea of under 50 mg. per 100 c.cm. was essential. If the figure exceeded 50, operation was postponed until the patient's condition improved. A range in the Calvert test of 1.5 per cent. was desirable, although in one case we operated on a man whose range was not more than 1.2 per cent., since his blood urea was only 36 mg. per 100 c.cm.

When these preliminary investigations were unsatisfactory a catheter was tied in. In this way the bladder was kept empty, and all back-pressure on the kidneys, except that due to possible nipping of the ureters in an extremely hypertrophied bladder wall, was eliminated. With the relief thus offered to the kidneys the blood urea falls remarkably quickly, if it is going to fall at all, and the furred, dry tongue of the man bordering on uraemia cleans in a few days. In one case in the series the response to this treatment was slow. This was a man, aged 69, who on admission in December, 1931, had a blood urea of 96 mg. His general condition was poor, and we had to wait for five weeks before a satisfactory report on the kidney function was obtained. He afterwards did so well that in June, 1933, he determined to go to Canada to live with his son. Before leaving he decided that a hernia which he had nursed for fifteen years was no longer essential to his well-being, and he presented himself for the radical cure. The herniotomy was duly performed, and the last report we heard of him was that he was well enough to contemplate a second marriage. While the catheter was tied in bladder irrigation was performed both alongside the catheter, by Janet's method, and through it. This minimized the risk of the upsetting urethritis which so often accompanies the indwelling catheter, and also cleared up the cystitis with which so many of the patients arrived in hospital. Many of the men had been living a "catheter life" while awaiting admission to hospital, and from their condition it would seem that we are not so far removed as we would like to think we are from the days when men carried their catheters in the brim of their hats and lubricated them with saliva. The solution used for lavage was 1 in 1,000 silver nitrate, which we found unequalled for this purpose. This pre-operative treatment gave highly satisfactory results. In the most outstanding case the blood urea fell from 165 mg. to 21 mg. per 100 c.cm. within eighteen days.

The Plan of Operation

In only one of the thirty-one cases was a two-stage operation carried out, and this was done in a patient who simply would not tolerate a tied-in catheter. The fibrosis produced by the use of a suprapubic catheter interferes with the speed and simplicity of the major operation and the healing of the second wound.

The anaesthesia used in all these cases was a mixture of chloroform and ether, followed by open ether. It was considered that inhalation anaesthetics were quite safe over such a short period as was necessary for the operation, and any risk attached to their use was no greater than that of the shock which in rare cases attended the employment of spinal anaesthetics in our other operations.

Concerning the actual operation, the great aim was speed. While the patient was being anaesthetized all possible preparations were made so that there should be no waste of time. The result was that the patient was never longer on the table than fifteen minutes, and this particular man weighed 18 stone, although he was only 5 feet 8 inches in height. In addition, he had four large vesical calculi. The average time was about ten minutes, but in many cases the operation was completed in eight minutes.

The prostate was enucleated in the usual way. The haemostatic bag was inserted and distended, and a large rubber drainage tube was slipped over the abdominal end of the haemostatic bag into the bladder. The wound was then closed. No attempt was made to remove tags or secure bleeding points in the prostatic cavity. These methods had been tried in an earlier series of cases but the mortality rose, and after a short time the operation was discarded. We were opposed to the ligation of the vas deferens, maintaining that any infection had better be allowed to travel to the epididymis, where it did no great harm, than be dammed back by a ligature and start up a never-ending vesiculitis.[1] The haemostatic bag used was Professor Fullerton's modification of Pilcher's. It was rounded in shape, to avoid the possibility of incontinence occurring as a result of the apex of the Pilcher bag being pulled down through the sphincter urethrae and stretching that very essential muscle beyond the limits of recovery.

Post-operative Measures

The post-operative treatment was essentially simple. The haemostatic bag and drainage tube were left in position for forty-eight hours. The bottom of the bed was raised on blocks, and pressure was maintained on the prostatic cavity by attaching a weight of 2 lb. to a thread which came from the interior of the bag down the urethral tube. The weight was then hung over the end of the bed. The patient usually had an uncomfortable feeling that the bladder required to be emptied while the bag was *in situ*, but the haemostasis obtained was excellent. At the end of twenty-four hours the fluid was removed from the bag and the bed lowered to the horizontal. Forty-eight hours after operation the bag and the drainage tube were removed. The bladder was then thoroughly washed out via the urethra, so that large portions of blood clot and other debris were pushed out through the abdominal wound. For these forty-eight hours the patient was "wet"; that is to say, the urine leaked through the drainage tube on to the abdomen, and frequent changes of dressing were necessary.

When the drainage tube was removed a modified de Pezzer catheter with a bell mouth was inserted. This was attached by a glass connexion to a rubber tube which led to a bottle suspended from the bed frame, where it was hidden by overhanging bedclothes. After the insertion of the de Pezzer catheter the patient was dry. The simplicity and efficiency of this procedure never failed to surprise visiting surgeons. I remember well that in my own student days one could have walked blindfolded round a ward and picked out the prostate cases without a moment's hesitation, while a ward that contained several cases smelt like a public urinal. The patient no longer gets curious glances on visiting days, because there is no smell to attract attention and the receiving apparatus is not on view. The comfort afforded to the patient by these " fair weather " conditions is inestimable, while the saving in the dressing expenses is considerable.

The success of this simple drainage method depended on the very small opening made into the bladder. The opening was just large enough to admit two fingers, and if more space was required it was obtained by stretching this opening and not by increasing the incision. Although the opening was small a prostate in one case weighing 8¾ oz. was successfully delivered in two portions. When the opening is small the bladder contracts around the drainage catheter, so that no leak occurs around the catheter on to the abdomen. For those who require a large opening for their manipulations more elaborate drainage methods are necessary if the patient is to be comfortable, because the bladder will not contract down sufficiently to prevent leakage.

Towards Convalescence

The next step was to get the patient up. The majority were up on the sixth day, and only a few— the tottering, toothless type—lay on as long as the eighth day. There were two exceptions to this. One man had a secondary haemorrhage on the sixth day. The haemorrhage was so sudden and so severe that although a haemostatic bag was inserted and the bleeding stopped in less than fifteen minutes from the onset, a blood transfusion was necessary. The other was our 18-stone patient, already mentioned, whom we left in bed till the eighteenth day, so afraid were we that the wound might open. The moral effect of being allowed up so early was tremendous, because no matter how well a man feels in bed the knowledge that he can get up puts him a step nearer home. The gentle exercise of sauntering round the ward is extremely beneficial in toning up patients of the prostate age. When out of bed the patient carried his receiving apparatus underneath his dressing-gown. In the summer of 1933 we had three convalescing cases in the unit when Mr. Jack Hylton, on tour in Belfast, paid a visit to the hospital with his band, and entertained the patients one fine afternoon in the grounds. Our three men sat in the mixed crowd, their urine dripping steadily into hidden bottles to the time of modern dance music, and nobody in the crowd knew anything about their condition. Two of these men were at the fourteenth day, the other at the seventeenth.

While these catheters were in position daily bladder lavage was performed by inserting the nozzle of a Higginson syringe into the urethra and allowing the fluid to escape by the de Pezzer catheter. In this way sloughs and other debris were driven out of the bladder. The solution used was again 1 in 1,000 silver nitrate. Until the fluid came away quite clear for three or four days the de Pezzer catheter was kept in the bladder. In this way we endeavoured to leave nothing behind which would act as a nucleus for the formation of a stone at some later date. When this catheter was removed a urethral catheter was again inserted, and the abdominal wound closed in two days at the longest. For this short time the patient was confined to bed. The catheter was then removed for the last time, and the patient passed water with the ease of a schoolboy.

Complications

In the thirty-one cases operated on by this method there was one death. This man developed anuria after operation, and in spite of everything that could be done the kidneys refused to function, and he died on the fourth day after operation.

The following is a summary of the complications in the other thirty cases:

Epididymo-orchitis occurred in five cases. This caused a transient upset, but with suitable treatment cleared up in four to seven days. Peri-urethral abscess was observed in two cases. These developed fistulae, but in both instances the fistula was healed before the patient left hospital. They were treated by suture over a catheter, after cleaning up the edges of the fistula. There is as yet no stricture. There was secondary haemorrhage in two cases. In one case, already mentioned, this took place on the sixth day, and in the other on the thirteenth day. Both were successfully dealt with by reinsertion of the haemostatic bag. This is quite readily done by passing a catheter per urethram. The end of this catheter is caught in the bladder by forceps passed into the bladder via the abdominal wound (Desjardin's forceps are ideal for the purpose). The end of the catheter is withdrawn and attached to the urethral tube of the haemostatic bag by a long suture, and the bag is then pulled into position and distended in the same manner as in the operation. The same weight-pull principle is also used.[2]

Suprapubic fistula developed in one patient after he had left hospital. This man was readmitted and a catheter was tied in for two days. By this time the fistula had closed, and there was no recurrence. Of the thirty cases two patients have since died, one of carcinoma of the oesophagus and one of pneumonia. Five cases were not traced. The remainder report themselves well as far as their urinary apparatus is concerned, which is no small consideration in men of 70 years of age.

Summary

A series of thirty-one cases of suprapubic prostatectomy with one death is reported, describing (1) preoperative treatment, consisting of bladder lavage through an indwelling urethral catheter ; (2) a method of postoperative drainage ; (3) a method for the treatment of primary and secondary haemorrhage.

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[1] Fullerton, A.: *British Medical Journal*, 1933, i, 161.
[2] Idem: Ibid., 1931, ii, 1078.

The International Organization of the Campaign against Trachoma will hold a meeting in the House of the Royal Society of Medicine on Wednesday, April 3rd, at 2.30 p.m. After an opening address by the president, Professor E. de Grosz of Budapest, Dr. A. F. MacCallan will outline the general principles of trachoma prophylaxis. Dr. J. Jitta will then indicate how the nations jointly could intensify their work against this disease, and Dr. Tewfik of Egypt will detail the social and legal measures which can be brought into operation. Professor Myashita of Japan will further elaborate this topic, and Dr. Zachert will deal with questions of administration. The secretary is Dr. F. Wibaut, Hoofstraat 146, Amsterdam.

SOME PRESENT-DAY PROBLEMS OF TUBERCULOSIS RESEARCH

BY

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AND

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I. FILTERABILITY OF TUBERCULOUS VIRUS

The discovery of the tubercle bacillus by Koch seemed at first to solve the riddle of tuberculosis. It was, however, realized later that by this discovery, great as the advance was, not all the problems of tuberculous infection in human beings had been solved. Now even the question of the tuberculous organism does not seem to have been settled, as since 1922 the phenomenon of the filterable virus, first observed in 1910 by Fontès in Rio de Janeiro in the Institute of Oswaldo Cruz, has been investigated with great industry by such French workers as Calmette, Nègre, Boquet, and Saenz, by Vaudremer and Hauduroy, and also by Arloing, Dufourt, and others. These authors obtained ultra-filtrates from special cultures, or from the organs of infected guinea-pigs, after passage through Chamberland L_2 candles or Berkefeld N filters, which produced, when injected into guinea-pigs, localized lesions or enlargement of the lymphatic glands, but no generalized tuberculosis. These glands sometimes contained a very few tubercle bacilli with or without characteristic histological alterations, while according to Nègre and Valtis calcification could be produced by filtrates when acetone extracts of tubercle bacilli were added to the filtrates, even when these were from the ineffective B.C.G.

These facts have been confirmed by many publications in other countries, while in this country the results obtained were mostly negative. Some advances in the investigation have been made by using the method of Ninni for the intraglandular injection of the neck, excluding as it does contamination and spontaneous infection, and facilitating observation. The method of Alessandri and Santanelli of using dialysis bags in the peritoneum for filtration has not been greatly developed.

TUBERCULOUS "GRANULES"

It is a well-known fact that some strains of tubercle bacilli, especially when under special conditions, differ from others in having a granulated bacillus, and seem to consist of a chain of small granules (Spengler's splitters, or Much's granules), which were noticed first by Babes (1885) and by Koch himself, who considered them to be spores. These granules were found to be partly acid-fast (as are the ordinary bacilli), partly Gram-positive (Much, 1908), or stainable only by Giemsa (Pagel, 1934). It may be assumed that these granules could pass filter membranes, as described by the French authors, especially as by other methods it has been shown that the life-cycle of the tubercle bacillus can include stages in which the virus has the nature of small granules or very small bacilli (Lominski). This investigation has been confirmed by single-cell cultures in micro-droplets by Morton Kahn, in which he observed various types of organisms: diplococcoid units of 0.1 to 0.38 μ, breaking down to dust-like particles which develop later into very small bacilli of a size of 0.3 to 1.2 μ and, later still, to mature tubercle bacilli. Mellon has shown that of sixteen strains used only two were found to be filterable.

We have used for our own purposes a strain, "bovine Vallée,"* alleged by the workers of the Institut Pasteur to possess a filterable virus. Employing the method of Ninni to inject the glands of the neck, we compared filterability through Chamberland L_2 filters with pores of a size of 0.5 μ with filterability though collodion membrane filters of a similar size, and with pores of a known maximum size, under comparable conditions of pressure and time. In this way we obtained some positive results with floating cultures of the strain, and a sufficient number of positive results from organs of infected animals after filtration through membrane filters. Altogether we secured seven positive results after filtration through membrane filter 0.75 μ, three positive results after passage through L_2 candles, and two positive results with membrane filter 0.3 μ. We have sometimes produced tuberculous lesions not only in the lymphatic gland of the neck, where the material was injected, but also some large tuberculous nodules in the spleen. In other cases only enlargement of the injected gland, with or without very rare acid-fast tubercle bacilli, has been observed. When tubercle bacilli were not found in the gland by means of smears or sections, we could sometimes demonstrate their presence by a culture on Loewenstein medium or by injection into another guinea-pig, producing a generalized tuberculosis.

Our findings confirm to some extent those of the French authors, and indicate that the filterability of the tuberculous virus, which is not always obtainable in a strain known to possess a virus, would seem to depend largely upon the size of the pores of the filter employed. It can therefore be assumed that the tubercle virus is not filterable in all stages of its life: this could be assumed from the findings of Lominski and Morton Kahn, as at one time only the large tubercle bacillus can be found. In addition, the smallest particles seen in the micro-droplet culture of Morton Kahn might not be able to infect guinea-pigs, even with the mild localized infection that was sometimes produced. This fact is, of course, important from the point of view of the immunity experiments which have been performed by Arloing and his collaborators, and by Nègre, Boquet, and Valtis. Careful experiments on the subject of immunity must be carried out in the future with various filtrates, but the method of filtering through filter membranes with pores of a standardized size is for this purpose quite indispensable.

Other questions, such as the subject of heredity of tuberculosis, arise from the investigation of the filterable virus. It has been shown by Calmette, together with Valtis, Boquet, and Nègre, that the injection of filtrates into pregnant female guinea-pigs infected the foetus through the placenta, and gave rise to enlarged glands and a state of "decomposition," but to no real tuberculous lesions, although typical Koch bacilli were sometimes found in the glands. These findings, confirmed in animal experiments by Arloing and Dufourt, von Beneden and Rabinowitsch, have been confirmed in the human pathology by Valtis and Lacomme and by Monckeberg and Vergara. Other clinical investigations suggest that diseases such as rheumatic purpura (Paisseau, Boegner, and Vaillard) or bronchial asthma (Sergent, Durand, Kourilsky, Benda) might be due to an infection with the filterable virus. It would, of course, be of great importance if the work of Doyle, Orr, and Purchase, who obtained a filterable virus from the milk and blood of tuberculous cows, were to be confirmed. It must be pointed out that Ninni has obtained filterable viruses from bovine, human, avian, and other types of tubercle bacillus.

* We are much indebted to the late Professor Calmette and Drs. Boquet and Saenz of the Tuberculosis Research Department of the Institut Pasteur in Paris for supplying us with these cultures.

II. ALLERGY AND TUBERCULOSIS

The investigations of Friedberger and Mita suggest that rise in temperature and other symptoms in infectious diseases are due to anaphylactic or allergic reactions in the body. In tuberculosis the allergy towards tuberculin is a well-known fact from the clinical investigations of von Pirquet. The hypersensitivity can be shown in general by rise in temperature and by reactions, both locally at the site of the injection and in the infective focus. Recently the question has arisen whether there is any relation between other allergic conditions, such as bronchial asthma, and tuberculosis (E. Fraenkel, Hamann, and Küpper). It was a general belief that tuberculosis and bronchial asthma exclude each other, because in statistical records of tuberculosis cases bronchial asthma was seldom mentioned. Thus Schroeder found in 4,700 cases of tuberculosis only 30 cases of bronchial asthma. Some clinicians considered that infection with tuberculosis afforded protection against bronchial asthma. From this clinical observation it has been shown by Seligman, Pagel, and Friedberger that tuberculosis in guinea-pigs afforded protection, to some extent, from anaphylactic shock in animals sensitized with horse serum.

B.C.G. AND ALLERGY

We have carried out some experiments in that direction with Calmette's B.C.G., because we thought that this method could perhaps be applied as a prophylactic or therapeutic measure in allergic cases. In twenty guinea-pigs injected with frequent large doses of B.C.G. over a long period, both before and after sensitization, we observed two instances of shocks with death, two of recovery, and two of mild shocks. In twelve controls we observed ten typical shocks with death and two typical shocks with recovery. It could, however, be demonstrated that a single injection or treatment with killed B.C.G. did not afford any protection, which was only obtained when the injection produced local foci. The protection was not afforded when large doses of desensitizing serum were employed. These findings correspond with those of Pagel and Garcia-Frias that in tuberculous guinea-pigs the protection from anaphylactic shock is due not to a specific anti-allergy, and not only to the spread of the foci, but to the whole condition of the infection in the body ("Durchseuchung"). Thus we cannot hope to get an effective and specific protection with B.C.G. in allergic cases. We had thought that this treatment might be used in place of the tuberculin treatment recommended by Storm van Leeuwen as a non-specific treatment for asthma.

On the other hand, we were able to show that in cases of bronchial asthma tuberculosis was not as rare as had been assumed before. As reported in an earlier communication, among 369 cases of bronchial asthma, all examined for tuberculosis by means of *x* rays and sputum smears, we found sixty-two cases with signs of past or present tuberculosis, sixteen of them with active tuberculosis, four with tubercle bacilli in the sputum, and four others with cavities in the lungs. In twenty-six cases inactive tuberculosis was present, and in twenty cases healed tuberculous foci. In a recent paper Küpper reports on fourteen cases of tuberculosis with asthma.

In all these instances the asthma was observed before the tuberculosis, and he assumes that the allergic condition of the body created a reaction towards tuberculosis. We must remember the fact that from a clinical point of view tuberculosis of the lungs has been classified by Ranke from the point of allergy or conditions of immunity. We must further bear in mind that the anergic condition of the body after measles creates in addition a predisposition to the onset of tuberculosis. It is of course possible that the mechanism of allergy, which has a tendency to spread out from one allergen to another, may lead from the first specific allergy towards a specific allergen, such as pollen, to a hypersensitivity towards the tubercle bacillus either under the symptoms of real asthma, as observed by Fraenkel, Hamann, and Küpper, or under the aspect of an exudative and active tuberculosis.

It has, however, been observed that the onset of asthma followed a so-called influenzal infection, which when investigated with *x* rays proved to be tuberculous. It is possible that the allergy towards tubercle bacilli in these cases was the first feature of allergy, and other hypersensitivities developed from this. It is, however, possible that the infection was the predisposing cause for the hypersensitivity towards the allergens.

In most of the cases of asthma and tuberculosis healed tuberculous lesions and inactive tuberculosis have been discovered. It may thus be seen that according to the animal experiments a species of antagonistic mechanism would seem to exist between the two conditions.

Pagel has pointed out that allergy in tuberculosis is an important factor according to the histological evidence, especially in the case of exacerbation of calcified lesions and in the breaking down (liquefaction) of the tissue prior to the formation of cavities. The experiments of Römer in producing cavities by the superinfection of allergic animals confirm that impression. In addition, the allergy of the whole animal towards tuberculin and the onset, spread, and form of tuberculosis must be kept in mind. These factors might be altered not only, as Pagel assumes, by the influence of the endocrine glands, but also by alterations provoked by other allergens.

This work has been done with the aid of the James Prophit Bequest for Tuberculosis.

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The Central Association for Mental Welfare has published the report of the conference held in the British Medical Association House last November, to which reference was made at the time in these columns. The various papers read are reproduced. These include: boarding out patients from mental hospitals, by Dr. W. Brooks Keith; a historical survey of the development of mental welfare work, by Miss Evelyn Fox, the honorary secretary of the Central Assocation; the modern institution, by Dr. Noel H. M. Burke; community care, by Miss Sybil G. Nugent; research, by Dr. L. S. Penrose; the voluntary provisions of the Mental Treatment Act, by Dr. C. Davies Jones; the functions of an educational psychologist, by Miss Lucy G. Fildes; and the work of an educational psychologist in a Scottish county. A verbatim record of the discussion following each paper is appended. The report is published at 3s. 6d., and may be obtained from the honorary secretary of the Central Association for Mental Welfare, 24, Buckingham Palace Road, S.W.1.

A CASE OF CAT-BITE FEVER

BY

G. E. BEAUMONT, D.M., F.R.C.P.

AND

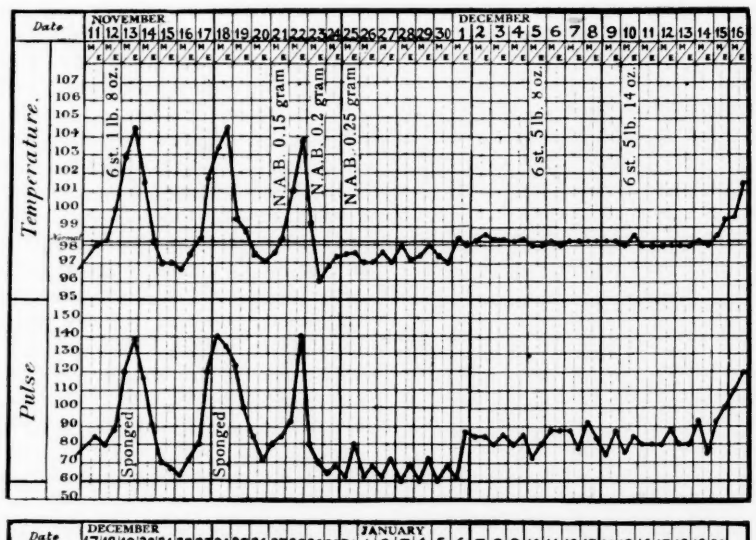
A. MORTON GILL, M.D.

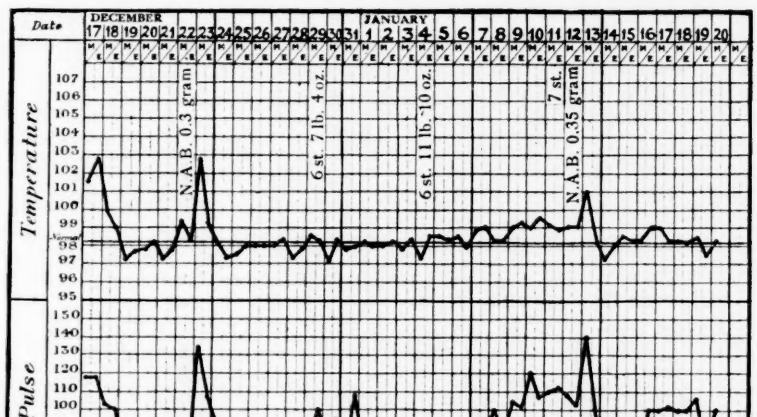
Cases of cat-bite fever are rare, particularly in this country, although a short note recording an instance of the disease was published by Collier in the *British Medical Journal* in 1924.[1]

It is generally agreed nowadays that rat-bite fever and cat-bite fever are one and the same disease,[2] and a case of rat-bite fever acquired from a dog was described in America last year by Ripley and Van Sant.[3] The disease is known as "sodoku" (Japanese "so" = rat, and "doku" = poison), and occurs all over the world.

Case Report

A girl, aged 14¾, was admitted to the Royal Masonic Hospital on November 11th, 1934, with the following history. On September 3rd, while releasing a stray cat from a trap in a garage, she was bitten on the back of her bare right leg just above the ankle. The wound was immediately washed, painted with iodine, and bandaged, and it rapidly healed. The leg, however, began to swell on September 12th at the site of the wound, and a watery exudate appeared. The wound then broke down and a painless lump, the size of a walnut, appeared in the right groin. No red lines, suggesting lymphangitis, were noticed. The temperature, taken for the first time, was found to be 103° F. On September 15th it was 104°, while two days later it was normal, and the child seemed better.





Pulse and Temperature Chart of the Case

On September 20th the patient was flushed and the temperature was again 104°, rising next day to 105°, when, after a profuse sweat, it once more fell to normal. On September 25th it rose to 102°. The wound on the ankle had again healed by September 31st. From this date to the time of her admission to hospital, on November 11th, the temperature rose periodically, approximately every fifth day, was raised for about forty-eight hours, and normal for about three days. With each wave of fever the patient complained of drowsiness, stiffness in both arms and, to a lesser degree, in the legs, loss of appetite, flushing of the face, and constipation. A rash was first noticed about two weeks after the cat-bite, and appeared with each wave of fever; it was confined to the face before admission, and showed itself in the form of two red curved lines on the forehead over the right eye.

No abnormal signs were found on admission, but a wave of fever started the next day, with a corresponding rise in the pulse rate, as shown in the accompanying chart. There was a very small increase in the respiration rate. On November 13th the patient vomited, and was delirious by night. The rash now appeared as circinate areas on the face, arms, and trunk, each composed of a white central area which was surrounded by a bluish-red erythematous zone. Further, there were two peculiar red curved lines on the forehead over the right eye. The temperature fell to normal on the following day; there was slight epistaxis, and the rash gradually faded.

Another wave of fever started on November 17th, with a reappearance of the rash and drowsiness. On November 21st, when the temperature was due to rise again, an intravenous injection of 0.15 gram N.A.B. was given. The fever was of shorter duration and the maximum rise 103.8°, instead of 104.2° as on the two previous occasions. The rash only lasted a few hours, and was less intense. There was no vomiting and no epistaxis. Subsequent injections of N.A.B. were given, 0.2 gram on November 23rd and 0.25 gram on November 25th. There were no further rises in temperature, and the patient appeared well.

She was due to return home on December 15th, when she complained of pain in the right arm, and her temperature started to rise, reaching 102.8° on December 17th and falling to normal by December 19th. The whole wave took four days. A diffuse swelling, about 2 inches by 1 inch, was found in the right triceps muscle; the skin over it was hot and a little red, and there was tenderness and limitation of movement in the right upper arm. On December 16th a similar swelling was found in the left arm in the left common extensor origin. On December 18th there was pain in the front of the chest, and an oval swelling about 1 inch by 1/2 inch could be felt in the right pectoralis major muscle. The patient sweated profusely the following day and the pain and swellings disappeared rapidly.

The temperature rose to 99.4° in the morning of December 22nd, and the pain, swelling, and stiffness reappeared in the right triceps muscle. An injection of 0.3 gram N.A.B. was given intravenously, and the temperature fell to normal that evening, but rose to 102.8° the next morning; subsequently the symptoms rapidly disappeared. Further muscular swellings, with slight rises of temperature, occurred on January 8th, 1935, in both forearms, and on January 12th a final injection of 0.35 gram N.A.B. was given intravenously. There were no further symptoms, and the patient was discharged home on January 20th.

Pathological Findings

The laboratory investigations were as follows:

Blood Counts ...	Nov. 14, 1934	Nov. 19	Nov. 29	Dec. 6	Jan. 9, 1935
Red cells	3,330,000	3,230,000	4,200,000	4,270,000	4,140,000
Hb per cent.	60	56	61	76	77
C.I.	0 89	0.86	0.72	0.84	0.92
White cells...	24,000	19,000	14,000	10,000	6,500
Polymorphs per cent. ...	—	94.7	62	53.7	—
Large mononuclears per cent.	—	1.3	4	4.7	—
Small mononuclears per cent.	—	4	32.7	40.7	—
Eosinophils per cent. ...	—	—	1.3	0 3	—
Mast cells per cent. ...	—	—	—	0.6	—

No abnormal red or white cells seen.

Urine: trace albumin; a few leucocytes; culture sterile. Blood culture on November 14th: sterile after eight days' incubation. Blood agglutination on November 15th: negative for *B. typhosus, paratyphosus* A and B, and *Br. abortus*. Blood Wassermann reaction: November 16th, slightly positive; December 6th, strongly positive; January 9th, negative. Both guinea-pigs and mice were inoculated with citrated blood taken from the patient on November 18th, but no spirillum was recovered.

Although the causative organism was not recovered from the blood there appears no doubt that the illness is an example of sodoku. Features of special interest are the muscular swellings, which do not seem to have been previously recorded, and a definite conjunctivitis, which disappeared after the injections of N.A.B. The positive Wassermann reaction is a characteristic feature.

Our thanks are due to Dr. L. E. H. Whitby for performing the blood inoculation into the mouse, and to Dr. Eastes's laboratory for the other pathological investigations.

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AN UNUSUAL OUTBREAK OF GASTRO-ENTERITIS

BY

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The outbreak of gastro-enteritis here described appears to be worth recording for two reasons: in the first place because, notwithstanding the increase of our knowledge of the causes of food poisoning in recent years—particularly as regards the Salmonella group of organisms—there is still much to be learned about the subject; and, secondly, because I feel that it is very easy to attribute mild attacks of gastro-enteritis to "gastric influenza" or other unknown causes when a more careful investigation might disclose a food infection. The present outbreak would probably never have come to light were it not for the fact that two deaths following gastro-intestinal symptoms were reported to the coroner, and the resultant inquiries from private practitioners revealed other cases of a similar nature.

As far as could be estimated the period covered extended from about November 12th to December 9th, 1934. Some seventy cases in all came to notice in this district, and there were, no doubt, many more mild cases which did not consult a doctor. One heard of a few similar cases occurring in neighbouring districts, but inquiry of other medical officers of health failed to disclose any widespread epidemic. The majority of patients were the only members of the family to be affected, but in eight instances there was multiple infection in the same house. An interesting example of multiple infection (which unfortunately was not reported until two weeks later) occurred at a sports club where about one hundred members from various parts of London met for tea on a Saturday afternoon, and, of these, twenty were afterwards taken ill.

Nature of Illness

All classes of the population were affected indiscriminately, and there was no selectivity for age or sex. In the most marked cases there was a fairly sudden onset, with severe epigastric pains, vomiting, diarrhoea, and collapse. As a rule there was no increase of pulse rate, and the temperature was normal or subnormal, except in young children, where there was an occasional rise of one or two degrees. Some cases had vomiting only, and a number complained of diarrhoea only. Even when the original illness was mild, convalescence was frequently associated with a feeling of profound depression and debility. It was possible to calculate the incubation period in the case of the group occurring in connexion with the sports club. They all partook of a common meal at tea-time, and in most cases symptoms began in twenty to twenty-four hours, with extremes of twelve to sixty hours. Bacteriological examination of the faeces was carried out in twelve cases without significant results. The two deaths which occurred during the time of the epidemic were both isolated cases, and were not of quite the same type as the others, but it was difficult to assign any other cause of death to them.

Fatal Cases

Case 1.—Male, aged 56. Previous health good. He complained of pains in arms and chest on morning of November 18th. At 12.30 a.m. on November 19th he was taken ill with acute epigastric pains, vomiting, and diarrhoea. He became very collapsed, and died at 5 p.m. on the next day. Post-mortem examination revealed a well-nourished man of good physique. The stomach and upper part of small intestine were distended. The stomach was sent to the analyst unopened and the interior was not seen. Small submucous haemorrhages were present in the small intestine. The large intestine was normal. All the other organs were normal.

Case 2.—Female (married), aged 44. Previous health good. On November 25th she complained of pain on the top of the head and epigastric discomfort. On November 29th she complained of nausea and was sick. There was slight diarrhoea and a general nervous tremor. There was no rise of pulse or temperature. She died suddenly and unexpectedly at 1.30 p.m. on the next day. Post-mortem examination revealed a woman of spare build. The interior of the stomach was intensely inflamed, and looked like raw beef. There was slight congestion of the lower end of the ileum, but there were no intestinal haemorrhages. There was very severe oedema of both lungs. The liver and kidneys showed severe parenchymatous degeneration, and the spleen was diffluent. The heart was normal.

A full bacteriological examination was carried out in both of these cases, but with the exception of a few colonies of *Staphylococcus aureus* from the spleen of Case 2, nothing significant was isolated. Analysis for inorganic poisons was also negative in both cases.

Epidemiological and Bacteriological Investigations

The private practitioners of the district were invited to co-operate in the discovery and investigation of cases, and an immediate and whole-hearted response resulted.

The possibility of gastric influenza was considered, but in view of the absence of general pains, respiratory symptoms, and pyrexia, it seemed most probable that an alimentary infection conveyed by food or drink was the cause. A detailed list of the food consumed as far as known was prepared in fifty cases. In the meantime Colonel Harold of the Metropolitan Water Board made a very thorough investigation of the local water supply, and assured me that an infection conveyed by water was most unlikely. It was also possible definitely to exclude milk as a source of infection. On analysis of the lists of food consumed it became apparent that there was no usual vehicle of food poisoning which was common to all, and if the source of the trouble was indeed food it must be one of the common widespread commodities.

The only foodstuff capable of harbouring bacteria which had been taken by everyone and could not be entirely excluded was butter, but there appeared to be no common source of supply except for the fact that 82 per cent. of the cases investigated were known to have consumed butter of an imported variety. In view of the large quantities of imported butter used, however, this is not necessarily significant. It was decided, however, to pursue the question further, especially in view of the fact that in two cases symptoms arose immediately after a change in the type of butter used. A specimen of the suspected butter was purchased on December 7th and consumed in normal quantities by a human volunteer. A mild diarrhoea with bright yellow stools followed. The specimen was then submitted for bacteriological examination and the following report was received.

"The cultures contain chromogenic staphylococci, also white staphylococci, and some short streptococci of the salivarius or faecalis type. The first-mentioned appears to be the important organism present, and it is the *Staphylococcus pyogenes aureus*."

The outbreak had now subsided, but further specimens of imported butter were obtained from different shops and were examined by Dr. Scott of the Ministry of Health with the following results:

No. 1.—Almost pure culture of cocci producing white and yellow colonies.

No. 2.—As No. 1, but with a few coli colonies and streptococci.

No. 3.—Indistinguishable from No. 1.

No. 4.—As No. 2.

No. 5.—A mixture of colon bacilli and *B. mycoides*. No coccal colonies.

One specimen was also submitted for chemical analysis with a negative result.

As is frequent in cases of suspected food poisoning, great difficulty was experienced in obtaining specimens of the actual food consumed, the more so as it was only possible to commence the investigations towards the end of the epidemic, and most of the inquiries related to convalescent cases.

Discussion

The epidemic differed from the ordinary type of food-poisoning outbreak in that it was spread over a period of a month, and it was difficult to find any definite connecting link between the cases. It is difficult, however, to accept any other aetiology than that of alimentary infection conveyed by food. The persistently negative bacteriological findings in the pathological specimens examined may be held almost certainly to exclude infection by the Salmonella or dysentery group of organisms. Attention is therefore directed to the part played by other organisms in gastro-enteritis.

Although I can find no record of an outbreak of gastro-enteritis caused by staphylococci in this country, the condition has been recognized in America, and several instances have been reported in which the *Staphylococcus aureus* chiefly has been suspected. In 1914 Barber[1] attributed toxic symptoms arising from the consumption of milk to infection by *Staphylococcus albus*. In 1933 McBurney[2] reported an outbreak of gastro-enteritis due to the contamination of chocolate éclairs by *Staphylococcus aureus*, and collected six other reports from the literature, all of which referred to cases occurring in America or its possessions. In these examples the foods involved were: milk (2), cake (2), chicken gravy (1), and cheese (1). All these outbreaks were of an explosive nature, and symptoms began after a short incubation period of two to three hours. The symptoms usually consisted of nausea, salivation, abdominal pain, vomiting, extreme prostration, diarrhoea, and chilliness. He suggests it probable that a large number of outbreaks of food poisoning in which the aetiological factor has not been determined have been due to organisms of the staphylococcus group. Jordan[3] used broth filtrates of staphylococci from various sources in feeding experiments with human volunteers, and produced a positive illness in a considerable proportion of his subjects. There is evidence that staphylococci with food-poisoning properties are sometimes present in cows' milk,[4] and a well-authenticated outbreak has been recorded recently.[5] A difficulty arises in correlating any particular strain of staphylococcus with the production of gastro-enteritis in that human volunteers have to be used in experimental work, and the illness produced is sometimes severe.

Although suspicion may fall on the *Staphylococcus aureus* as a possible cause of the outbreak under discussion, there is not sufficient evidence to come to any definite conclusion. It would appear from the foregoing that the *Staphylococcus aureus* is a potential cause of gastro-enteritis, and that butter is sometimes contaminated by that organism to a considerable degree. *Staphylococcus aureus* was isolated from the spleen in one of the fatal cases, but this finding is not necessarily significant.

Summary

An outbreak of gastro-enteritis is described which extended over a period of a month and affected upwards of seventy people, two of whom died. The cause of the outbreak was not definitely determined, but infection by the Salmonella and dysentery groups was almost certainly excluded. The symptoms consisted of severe epigastric pain, vomiting, diarrhoea, and collapse, with a normal or subnormal temperature. Attention is drawn to the *Staphylococcus aureus* as a proved cause of food poisoning, and to its presence in certain specimens of butter, the only food which came under suspicion. There is no evidence, however, regarding the toxigenic properties of these particular strains.

I should like to express my thanks to Colonel Harold of the Metropolitan Water Board, to Dr. Scott (who carried out most of the bacteriological examinations) and Dr. Maitland of the Ministry of Health, and to the private practitioners of the district for their valuable help.

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"Bringing Science into the Road Traffic Problem," by Colonel Mervyn O'Gorman, has been published as a pamphlet (with five appendices) by the British Science Guild. Copies—price 1s. 1d. each, including postage—are obtainable on application to the secretary of the Guild, 6, John Street, Adelphi, W.C.2.

THE DIAGNOSIS AND TREATMENT OF MALIGNANT DIPHTHERIA

BY

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As the malignant type of diphtheria which is at present causing serious anxiety in many towns appeared in Bristol in 1920 and has been present here since, the writer has had unusual opportunities for studying this type of disease. It differs from the classical type of diphtheria by the extremely rapid intoxication of the patient and the slow appearance of membrane, which may be delayed for two to three days. It frequently attacks adults, and is easily mistaken for quinsy. The differential diagnosis between the two diseases can usually be made by observing the following points:

Quinsy	*Malignant Diphtheria*
Rare in children under puberty.	Common in children and not uncommon in adults.
Extremely painful.	Not very painful.
Mouth full of mucus and saliva.	Mouth comparatively dry.
Fauces deeply reddened and congested, mucous membrane of palate reddened.	Fauces swollen and oedematous, less inflammation, uvula often very swollen and translucent. Mucous membrane of palate pale.
Patient cannot open his mouth far.	Mouth can be opened without difficulty.
Difficulty in speaking.	Usually little difficulty.
Neck glands hard and painful.	Great painless oedema of neck, outline of glands lost in oedematous tissues.
Patient sleepless and restless.	Often very drowsy.
No fetor.	Fetor sometimes marked, but often absent during early stage.
No deposit on tonsils.	Gelatinous film, but true membrane not present for forty-eight hours or later.
Pulse full and bounding.	Pulse rapid and compressible.
Nasal discharge scanty and muco-purulent.	Nasal discharge profuse, often serous.

Of all these signs the most pathognomonic is the great painless neck oedema of diphtheria, but this may not be present until the second day. Early albuminuria is suggestive of diphtheria, but it is not always present until the third or fourth day. In malignant diphtheria the temperature is very variable and may be high, temperatures of 103° to 105° F. being not uncommon during the first two days. Another difficulty is that swabs taken in the early stages are often returned as negative, even when examined by a highly competent pathologist. Laryngeal involvement is comparatively rare.

Treatment

If a diagnosis of malignant diphtheria is made 30,000 to 100,000 units of serum must be given intravenously and 24,000 units intramuscularly. It is more easily administered by means of a 30 c.cm. syringe with an eccentric attachment for the needle, into the veins in the antecubital fossa. We find it is best not to attempt to dissect out a vein, as the vein clots so easily if touched or pulled on. A fine needle is necessary. When we have failed with an elbow vein we have frequently been successful in getting into the external jugular vein by an assistant pressing his finger on its lower portion to make it stand out.

For the last five years we have used the following accessories to treatment. The theoretical reasons for their adoption have been discussed at length elsewhere.[1] The most valuable one is the intravenous injection of 20 per cent. glucose combined with 1 in 500 colloidal iodine. This material is made up ready for use by British Colloids in 150 c.cm. containers. The amount given varies from 30 to 150 c.cm., according to the stage of the disease and the age of the patient: not more than 90 c.cm. to a child under 10; none should be given on the first day of disease. It should be administered with the antitoxin. To get any benefit in the later stages enough should be given to produce glycosuria for six hours. If the glycosuria persists for more than six hours 5 to 10 units of insulin should be prescribed, but not otherwise. A smaller repeat dose, followed by 10 units of insulin, should be given if the patient shows signs of heart failure. To restore the depleted alkali reserve[2] the following mixture should be given in half-ounce to one-ounce doses until the urine is alkaline to litmus.

℞	Sod. bicarb.	gr. xxv
	Calc. carb.	gr. v
	Pot. bicarb.	gr. v
	Aq. menthe pip.	ad ʒ j

This takes three to four days. In addition, tincture of iodine (*B.P.* 1914) should be given in milk, 1 minim for each year of age up to a maximum of 20 minims, four-hourly. If no more than 10 minims is added to each ounce of milk it is practically tasteless. The iodine must be given in four-hourly doses until all albuminuria has disappeared. This may take a month in the worst cases. We think that, as diphtheria toxin has a strong affinity for lipoids (heart muscle and nerve sheaths), and as iodine also has the same affinity, the iodine tends to turn out the toxin and prevent, to a considerable extent, the more serious paralyses. The presence of albuminuria indicates that all the toxin is not yet eliminated. In addition, we give 1/4 to 1 grain of thyroid. sicc. daily to stimulate the sluggish metabolism after diphtheria. If these drugs are given in these doses until, and only until, albuminuria has quite gone, no sign of renal irritation or hyperthyroidism is ever observed, even if given for as long as five or six weeks. If continued for some days after the albuminuria disappears haematuria may be produced. As intravenous injections of horse serum may produce rigors and hyperpyrexia, the rectal temperature should be taken every ten minutes for two hours after the injection, so that suitable measures to overcome this dangerous complication may be taken at once if it occurs.

We have been recently trying the relative values of the usual concentrated (globulin only) antitoxin and whole antitoxin (that is, the antitoxic serum as derived from the horse without concentration). These results are insufficient as yet for complete analysis, but it is worth while recording a very unexpected finding. On intravenous injection of concentrated serum (globulin only) rigors and hyperpyrexia are frequent, but in not one case has this occurred in 100 trials with whole-horse serum, although the material has been obtained from several horses from two different firms. Whole-horse serum, therefore, appears to be far less toxic, given intravenously, than the globulin-only serum, although the bulk of the former is generally double the latter. We have found that the injection of 2 to 4 c.cm. of haemoplastin (P. D. and Co.) is extremely valuable in preventing the haemorrhagic tendency which these severe cases so often show. It should be given before haemorrhage starts in all severe cases as soon as they come under treatment.

The whole method of treatment herein recorded has been applied to all our malignant cases for the last five

years (22 per cent. of the total admissions), with a death rate for the whole admissions of 3.1 per cent. on 3,824, compared with a mortality of 5.7 on 3,131 cases in the previous five years. If the malignant cases only are considered in each group, the death rates in these groups are 14 and 27 respectively. The proportions of malignant cases have been almost identical in the two last five-year periods, although fluctuations occur from year to year. Below is a table of the number of cases treated in this hospital during the past thirty years. Hospital figures are more reliable than notifications, as we find anything up to 20 per cent. of our total notifications are not cases of diphtheria, and, of course, cannot be included in these figures. The percentage of notification errors tends to increase during epidemic times, causing a reduction of the mortality rate based on notification figures, and thus masking the severity of an outbreak.

Years	Total Hospital Discharges	Died	Death Rate per cent.
1905–09	1,956	109	5.5
1910–14	1,852	82	4.4
1915–19	1,684	90	5.4
1920–24	3,439	260	7.6
1925–29	3,131	179	5.7
1930–34	3,824	118	3.1

It may be suggested that these figures show only a natural decline in the virulence of an epidemic which reached its most virulent peak in 1921 (mortality 8.7 per cent.). The writer, after a fever hospital experience of twenty-five years, can only say that in his opinion half of the types of case we previously lost now recover, with the disappearance almost entirely of the distressing persistent cardiac vomiting syndrome from our wards, from the first day we put this method of treatment into operation.

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Clinical Memoranda

Retroperitoneal Sarcoma with Pain Referred to the Thigh

The clinical interest in this case lies in the demonstration of the ease with which one may, in the beginning, overlook the serious significance of pain felt in the leg when the real cause is infiltration of the nerves in the abdomen by growth. The microscopical examination, carried out by Dr. Grace, pathologist to the Chester Royal Infirmary, showed the growth to be a round-celled sarcoma.

A man, aged 25, reported on April 12th, 1934, complaining of pain in the anterior and lateral parts of the right thigh. Examination of the leg proved negative, and the condition was considered to be one of muscular rheumatism. The complaint dated back to about the beginning of March.

The patient reappeared on May 24th, complaining once more of pain in the right thigh and right loin. The pain in the leg was experienced chiefly on the lateral aspect, and pressure over this area caused much distress. Examination of the thigh showed nothing abnormal, but it became fairly clear that the original diagnosis was a mistaken one and that the pain was caused by involvement of the nerves at a higher level. By May 28th the pain had become so severe that the patient had to remain in bed. Sleep was almost impossible. He was admitted to hospital on June 6th. The urine contained a definite amount of albumin, with some pus cells. The blood urea was found to be high—240 mg. per 100 c.cm. There was marked rigidity in the right loin, but no definite mass could be felt. The temperature ranged from normal to subnormal. There was a moderate leucocytosis. The general condition gradually deteriorated, and death occurred on June 12th, the patient having more or less been unconscious for two days before.

The only other symptom of note was the presence of a considerable quantity of frothy sputum, which, however, was not blood-stained.

Post-mortem Findings.—The kidneys, macroscopically, appeared normal, but just below the lower pole of the right kidney infiltrating the right ilio-psoas muscle was a large fixed sarcomatous mass, with many outlying nodules. Its size was about that of a child's fist, and it involved the nerves running down towards Poupart's ligament. The liver showed no secondaries, but both lung bases presented numerous small growths, the largest being about marble size.

Wrexham. D. LIVINGSTONE POW, M.B., F.R.C.S.Ed.

Muscarin Poisoning and Melancholia

The predominant part played by the toxic factor in certain mental disorders is now generally recognized. In general, the small amount of toxin, and its complex constitution, render its identification impossible.

In the course of an investigation of the toxaemias associated with mental disorder, a definite group has come to light in which the toxin is allied to muscarin. Four independent considerations led us to expect that such a group existed.

1. The injection of a foreign protein gives rise to an antibody, and, according to Friedberger, the combination of these two when acted on by complement is toxic.
2. Le Marquand, in 1923, working at Bethlem Royal Hospital, found that in a series of toxic-looking melancholics, in whom wasting and a poor physical condition were outstanding features, there was an excessive complementary power of their sera.
3. Clinically, bromides, which are anti-complementary, often prove of benefit in these cases.
4. Also, it has been known for a long time that certain cases of melancholia recover under treatment with atropine.

The patient's serum, controlled for *p*H, osmotic pressure, and temperature, was perfused through the heart of a killed frog. The tracing shows the effect on the frog's heart of the serum of such a case, and the recovery under atropine.

Tracing of frog's heart showing effect of serum of F. followed by atropine.

This patient (F.) was a man aged 50. He had a bad quinsy, and lost 1 st. in weight. A month later he was admitted to Bethlem Royal Hospital; melancholic, thin, and toxic in aspect. He was given full doses of atropine, and became very restless. The atropine was stopped for three days, and then recommenced in small doses. Steady improvement followed. A month later his condition became stationary and he was transferred.

The number of these cases is small—some eighty patients were examined before this case was discovered. Since then similar cases have appeared from time to time: in general, the result of treatment is better than in the case described. Clinically, these cases have a toxic aspect; moist skin; they swallow frequently, from excessive salivation; they have small pupils and no fever. In our cases the heart rate has been normal.

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Reviews

THE PREMATURE INFANT

The records of nearly two thousand children cared for at the Premature Infant Station of the Michael Reese Hospital, Chicago, have been made use of in the latest addition to the Behaviour Research Fund Monographs under the title of *The Physical and Mental Growth of Prematurely Born Children*,[1] by Drs. J. H. HESS, G. J. MOHR, and P. F. BARTELME. Dr. Hess's work for the premature baby is well known, and his own contributions to this volume explain the development of a system whereby over two hundred babies, presenting the many difficulties inherent in immaturity, are now cared for each year with a gross death rate of less than 25 per cent. The main part of the book is concerned, however, with the "graduates"—that is to say, babies who have successfully passed out of the special clinic—and it is an attempt to answer certain fundamental questions: "What is the ultimate outcome for the prematurely born infant?" "Do they suffer from a higher morbidity and mortality in early childhood than the full-term infant?" "Are those who survive normal mentally and physically?" The solution of these problems is dealt with in various ways, and the statistical tables and numerous graphs contained in the book present a vast amount of valuable information for the paediatrician, the psychologist, and many others interested in the welfare of the child. The authors also make out a good case for the establishment of such a clinic in every large city.

RADIOTHERAPY: THEORY AND PRACTICE

The new edition of the well-known textbook on radiotherapy by Dr. PAUL COTTENOT and Dr. SIMONE LABORDE[2] has been entirely recast, and whereas in the previous edition the subjects of *x*-ray and radium therapy were treated separately—that is, in different sections of the book—in the present volume they are considered together. This is, we think, as it should be. It is no longer possible to separate the two subjects in practice, and although, of course, some will still elect to carry out radium treatment while others will confine their clinical work to the therapeutic use of *x* rays, a knowledge of both subjects is essential in either branch of radiotherapy.

We owe a vast debt of gratitude to the magnificent work of the French school. It was Dominici who in 1907 pointed out the necessity for using only the very penetrating gamma rays of radium in most forms of treatment, and later research, both clinical and experimental, has confirmed this. In recent years the French school has no less strongly emphasized the prime necessity of combining high-voltage *x*-radiation with radium in practically all malignant conditions. The present work deals fully with the more theoretical side of the question—the physics of *x* and radium rays. Methods of dosage, measurement, apparatus, and biological action are discussed, some in more and some in less detail, but always with clearness, and, what is more, simplicity of exposition. We have, indeed, but one criticism upon this excellent book, and that is that the all-important question of the biological action of the rays receives less than its due space. In France the importance of the matter has long been recognized, but in this country, so far as we know, only one or two books have been published which are primarily devoted to the action of radiation on normal cells and organs. It is high time that this was remedied, and that a comprehensive study of what may be termed "experimental radiology" was required of all who seek to obtain special diplomas in radiology, especially if their intention is to practise radiotherapy, whether by radium-surgery or by *x*-rays.

About one-half of this textbook is devoted to the clinical uses of the rays, comprising two sections of approximately equal length. In the first the radiotherapeutic measures necessary for the treatment of pathological conditions affecting various regions are discussed, while in the second are collected the treatments applicable to malignant tissue, together with a clear and concise account of the general principles underlying such treatments if they are to be successful. The book is one which may be thoroughly recommended not only for its intrinsic value but also for the remarkably interesting way in which the subject-matter is presented.

A PRACTICAL MANUAL OF DISEASES OF THE CHEST

Dr. MAURICE DAVIDSON is to be congratulated on a book for which there is a genuine demand.[3] Although primarily intended for the specialist this work is not too big for the busy practitioner or too advanced for the student. Indeed, students would do well to read the chapters on radiology and physical examination of the chest, for the author has wisely eliminated many of the useless signs which have been described and copied from textbook to textbook. It may be regarded as a standard work, describing briefly but adequately our present knowledge of diseases of the chest.

The modern treatment of bronchiectasis is fully discussed, and it is pointed out that lobectomy is often possible, and offers the only hope of a real cure, although other surgical procedures, and even the simple medical methods, often give relief. Reports of eight cases are included at the end of the chapter, and illustrate many of the difficult problems which bronchiectasis presents. In dealing with tuberculosis the author again stresses the importance of surgery and the enormous advance which surgical technique has made in recent years; but, whilst recognizing that surgical aid should not be called in too late, he wisely warns his readers against unrestricted enthusiasm for major surgery. Great as has been the advance in the treatment of pulmonary tuberculosis or abscess and bronchiectasis, the treatment of asthma remains unsatisfactory, and excepting methods of relieving the attacks by new variations of old drugs or inhalations, little progress has been made in recent years. The same may be said of pneumonia, the wisest treatment of which still seems to be to leave the patient alone with a good nurse. This book contains the latest views, and in describing the specific treatment by vaccine or serum the author considers that, on the whole, specific serum treatment in Types I and II may be helpful. He also refers to cases treated by artificial pneumothorax, but we agree with him that this is a procedure unlikely to have a very general application. The chapter on obscure clinical radiological phenomena is original, and some very interesting case reports are given. The "fleeting" *x*-ray shadow is always a difficult problem, and, as the author remarks, the explanation of many of them seems to be

[1] *The Physical and Mental Growth of Prematurely Born Children.* By Julius H. Hess, M.D., George J. Mohr, M.D., and Phyllis F. Bartelme, Ph.D. United States of America: University of Chicago Press; Great Britain and Ireland: Cambridge University Press. 1934. (Pp. 449; 89 figures. 22s. 6d. net.)

[2] *Radiothérapie. Rayons X-Radium.* (*Traité de Pathologie Médicale et de Thérapeutique Appliquée.* Tome XXXII, Fascicule II.) By Paul Cottenot and Simone Laborde. Paris: N. Maloine. 1934. (Pp. 514; 80 figures. 70 fr.)

[3] *A Practical Manual of Diseases of the Chest.* By Maurice Davidson, M.A., M.D., F.R.C.P. London: H. Milford, Oxford University Press. 1935. (Pp. 528; 199 figures. 42s. net.)

temporary collapse of the lung. Thrombophlebitis migrans accounts for some of these shadows, and might have been the cause in Case 4. One feature that might well be copied by other authors is the introduction of numerous case reports illustrating the various diseases ; these make it much easier to follow the course and variation of the disease and the difficulties which arise in treatment, besides adding considerably to the interest.

An appendix provides a list of prescriptions which are referred to in the text, and the book concludes with a good index. The subject-matter is well arranged, and the author has avoided the mistake of quoting at length the conflicting opinions of various authorities on controversial subjects. A few references are, however, given at the end of each chapter. The book contains many excellent illustrations and skiagrams. It is very well printed and produced by the Oxford University Press.

PATHOLOGY FOR STUDENTS

The second edition[4] of Bell's *Textbook of Pathology* shows an increase in size of 136 pages over the first edition ; it has also been extensively revised. The various topics are discussed more fully, a large amount of new material has been introduced, and greater attention has been given to pathological physiology, especially where simple phenomena are concerned. The book is the work of five contributors ; the greater part, including the whole of general pathology, is written by Professor Bell himself, while the chapters on mycoses, diseases of the heart, thymus, spleen, liver, and blood have been undertaken by Professors Clawson, Downey, McCartney, and Watson. An entirely new chapter has been added on diseases of the bones and joints ; in this, several of the diseases which are of particular interest at the present time, such as osteitis fibrosa, are described, as well as many of the rarer lesions. Some mention of tuberculosis might perhaps have been given in this chapter with advantage, by way of supplement to the somewhat brief accounts given under general pathology. Among the new material inserted in the various sections may be mentioned immunity in inflammation, torulosis, granulosa-cell carcinoma and arrhenoblastoma of the ovary, endometriosis, stenosis of the isthmus aortae, psittacosis, mucocele of the vermiform appendix, von Gierke's disease, and myasthenia gravis. Many of the original descriptions have also been revised and some of them entirely rewritten ; this applies more especially to tuberculosis of the lung, nephritis, spina bifida, and pernicious anaemia. Numerous minor additions and alterations have been made in other sections of the work. A useful innovation has been made in the bibliographies at the end of the chapters ; after each reference the special features and scope of the articles are briefly indicated in brackets. The book is well illustrated, and many of the microscopical drawings are of unusual excellence.

The Outlines of Physiological Pathology,[5] by Dr. HANS LUCKE, contains within a moderate compass an excellent résumé of that subject, intended for the use of students and more especially for those who are commencing clinical work. It is not, in the manner of some "outlines," a mere classified list of headings, subheadings, and definitions, designed as a cram-book for examination purposes ; the subjects selected are fully discussed in clear and simple language, and the limitation of the size of the book is secured by a judicious choice of material. The author has in the first place taken clinical requirements into account ; his aim has been to assist the student to obtain from the clinical symptoms and the results of laboratory investigation an insight into the nature of the pathological processes taking place in the bodies of the patients under observation. He has therefore limited his descriptions to those pathological processes which are well enough understood to allow useful discussion of them in the clinic. Theoretical questions and complicated interpretations of unsolved problems are excluded ; for these the student is referred to larger works, such as Krehl's well-known book. The first five chapters deal with intermediate metabolism, vitamins, and hormones ; the three following, with pigment and other deposits and with calculi. Five chapters are devoted to respiration, circulation, urinary and digestive functions, and the nervous system ; and the two final chapters refer to heat regulation and infection. The book is furnished with a very full index.

OCULAR REFRACTION

There are many books on the practice of refraction. Most of them have some meritorious feature, since they are the reflection of the extended experience of competent ophthalmologists who possess the power of expressing themselves in print. Among these books there are few that excel or equal *The Practice of Refraction*,[6] by Sir STEWART DUKE-ELDER. This first appeared in 1928, and now there is published a second edition. In the new edition the greater part of the text is the same, but there are included new sections dealing with recent work on the incidence of refractive errors, on the aetiology of myopia, on the treatment of muscular imbalance and of squint by orthoptic methods, on the use of the refractometer, and the use of contact glasses. Some of the matter of the first edition has been omitted, so that the book is now a little smaller.

On the aetiology of myopia the author discusses the several theories of the cause of axial myopia, and concludes that, in addition to the primarily developmental fault which must be postulated in the aetiology of myopia in its higher degrees, several adjuvant factors have no inconsiderable influence on its progress, more particularly excessive near-work, bad ocular hygiene, and physical debility. The most important of these is near-work, especially when it is enforced early in life about the fourth year in a child whose physical condition is poor. Its deleterious effects are reinforced by too long hours of application with insufficient intervals of relaxation between them, poor illumination and faulty ventilation, the use of books poorly printed in small and closely spaced type, and the provision of badly adjusted desks and stools, which require a strained and unhygienic attitude. Statistics have conclusively shown that the proportion of myopes increases rapidly and steadily during the years of school life in a ratio greater than its mere age incidence warrants.

The section on contact glasses, their nature, usage, and advantages and disadvantages, is a most useful summary of present-day knowledge, and the book as a whole will be invaluable to the serious student and a means of stimulation and refreshment to the experienced ophthalmologist.

[4] *A Text-Book of Pathology*. Edited by E. T. Bell, M.D. Second edition, enlarged and thoroughly revised. London: H. Kimpton. 1935. (Pp. 767 ; 364 figures, 2 coloured plates. 37s. 6d. net.)

[5] *Grundzüge der Pathologischen Physiologie*. By Dr. Med. Hans Lucke. Berlin: Julius Springer. 1934. (Pp. 195. RM. 6.60.)

[6] *The Practice of Refraction*. By Sir Stewart Duke-Elder, D.Sc., M.D., F.R.C.S. Second edition. London: J. and A. Churchill, Ltd. 1935. (Pp. 383 ; 180 figures. 12s. 6d.)

Notes on Books

Feeling that a small and systematic work on the principles and practice of teaching is needed by those who give instruction in English schools of nursing, Miss ALICE M. JACKSON and Miss KATHARINE F. ARMSTRONG have set out the fruits of their large experience in a book, partly theoretical, partly practical, entitled *Teaching in Schools of Nursing*.[7] The authors have handled their task well, and Professor Cyril Burt commends the book in a sympathetic introduction.

We have received the bound volumes of the Minutes of the General Medical Council and of its various committees for 1934, complete with fifteen appendices (vol. lxxi); also the general index to the minutes of the General Medical Council, the Executive and Dental Executive Committees, and the English, Scottish, and Irish Branch Councils for 1903–34 (vols. xl to lxxi). Both volumes are published and sold for the General Medical Council by Constable and Co., Ltd., 10, Orange Street, Leicester Square, W.C., and the prices are 12s. and 10s. respectively.

Salmon Tactics,[8] by P. E. NOBBS, will particularly interest salmon fishermen who live in Eastern Canada or who propose visiting it, but there is much of interest and value generally. The drawings are excellent.

[7] *Teaching in Schools of Nursing*. By Alice M. Jackson, M.A., and Katharine F. Armstrong, D.N., S.R.N., C.M.B. London: Faber and Faber, Ltd. 1934. (Pp. 228. 6s. net.)

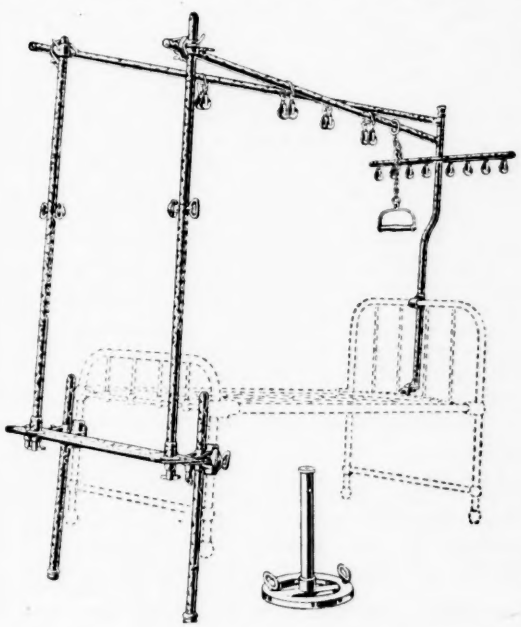
[8] *Salmon Tactics*. By Percy E. Nobbs. London: P. Allan and Co., Ltd. 1934. (Pp. 147; 19 drawings. 10s. 6d. net.)

Preparations and Appliances

METAL EXTENSION AND SUSPENSION APPARATUS FOR LIMB FRACTURES

Major MEURICE SINCLAIR (London, W.1) writes:

In the treatment of fracture of a long bone or an inflamed joint the first essentials are the application of extension below the seat of fracture or site of inflammation in the limb, and the immobilization of the parts. To assist one in effectually achieving these ends, it is preferable to suspend and extend



the limb concurrently. The principles involved in the "Universal Suspension," illustrated here, are now of twenty years' standing, and are simple. It is an efficient apparatus made entirely of metal, and completely replaces the old wooden model. Moreover, it can be readily fixed to any ordinary hospital iron bedstead.

The shelf at the foot end is established by means of two brackets to the legs at the lower end of the bed. This shelf has suitable holes drilled through it to accommodate the lower vertical pole or poles for the various positions of adduction or abduction. The vertical pole at the head end, which carries the cross-bar with eight pulleys, is fitted to the top tube of the bedstead, and is also fastened to the angle-iron of the mattress frame by means of special clamps. The clamps are first fixed in their position, and the pole is then dropped into place through a hole in the top clamp. The top sleeve of the vertical pole at the head can be glided off, and either one, two, three, or four long beams can be threaded on to this pole, while their supporting poles at the foot end are either fixed to the drilled shelf or attached to a movable floor pedestal. The long beams are secured to the foot verticals by means of Maddox blocks. All the pulleys can easily be adjusted to any position and held there by ready fasteners.

The apparatus will permit one, two, three, or all four splinted limbs to be suspended and adequately extended simultaneously. It will allow, in addition to suspension and extension, any degree of abduction or rotation of a limb; this can be very simply procured by altering the position of the lower vertical beam or beams by the adjustment of one butterfly-nut for each limb. These vertical and horizontal beams are made to travel through Maddox blocks, which fix them at the correct levels and at economical positions. A minimum of floor space is consequently utilized, while the beds can readily be moved about the ward, or on to a veranda, or for *x*-ray purposes. There is a pair of telescopic legs attached to the two brackets which are fastened to the lower legs of the bedstead, and these will allow the lower end of the bed to be raised to more than two feet in height, if ever so required. A patient can be held also for plaster work, and can, with the aid of cord and pulleys, be slung in a vertical position by two loops of gauze each passing round the side of the neck under the occiput and chin, or from under the axillae. These are attached to the horizontal beam, which is fixed to the pedestal. The plaster can also be applied to a patient slung and held in the horizontal position with the spine extended, by fixing gauze just above and around each knee-joint, while a third loop passes round the chest, under the axillae, and is fastened over two pulleys on the cross-bar on either side of the head vertical.

All the component parts are suitably arranged so as to be out of the way of the nurses and surgeons. No spanner or keys are required, as the apparatus is absolutely complete with tackle and pulleys within itself, and is made for me by Messrs. Whitfields Bedsteads Limited, 12, Dane Street, London, W.C.1.

"PROGESTIN"

Progestin (British Drug Houses Ltd.) is a preparation of the corpus luteum hormone purified sufficiently to permit of intramuscular administration. The preparation is standardized physiologically by its effect in causing endometrial proliferation of the uterus of the immature rabbit. The activity is measured in rabbit units, and the human dose suggested is about 2 r.u. per week. The hormone causes proliferation of the uterine endometrium and also renders uterine muscle insensitive to the stimulant action of the oxytocic principle of the posterior lobe of the pituitary gland. Progestin is recommended for prophylactic treatment of habitual abortion and for treatment of dysmenorrhoea. Moreover, it is recommended, in combination with oestrone, for amenorrhoea. Recent advances in physiological knowledge and clinical trials have indicated that this hormone may prove to be a valuable therapeutic agent in gynaecology.

"AMPHYL"

"Amphyl" (Lysol Ltd., Raynes Park, S.W.20) is an antiseptic preparation which contains chlor-xylenol and homologues of phenol dissolved in saponified oils. It is a powerful disinfectant with a phenol coefficient from 6 to 12. Its special virtues are that it is non-corrosive, non-irritant, odourless, and mixes with water in all proportions. It appears to be a very useful antiseptic suitable for a wide variety of surgical and medicinal uses.

STAPHYLOCOCCUS TOXOID

Staphylococcus toxoid (Burroughs Wellcome and Co.) is a preparation for prophylaxis against and treatment of chronic superficial infections. It is supplied in two strengths: Toxoid B, which is undiluted, and Toxoid A, which is diluted 1 in 10. Promising results in the treatment of boils, carbuncles, sycosis, and blepharitis have been reported from Melbourne and Toronto. The preparation is given intramuscularly in doses starting with an initial injection of 0.5 c.cm. Toxoid A and ascending until a dose of about 1 c.cm. Toxoid B is reached.

THE MALARIA EPIDEMIC IN CEYLON

FIRST-HAND EXPERIENCES

The epidemic of malaria in Ceylon, which began in the autumn of last year and reached its peak in December, was the subject of an address by Dr. V. B. Wigglesworth at the London School of Tropical Medicine and Hygiene on March 14th. Dr. Wigglesworth has just returned from a six months' tour, under the auspices of the school, of India, Burma, Malaya, and Java, and he touched at Ceylon when the epidemic was at its height. Ceylon, he said, from the point of view of malaria, might be divided into three zones—the dry, the wet, and the foothill.

THREE ZONES

By the rules of malariology as established in India, Malaya, and elsewhere in the East, the foothill zone might be expected to suffer from intense malaria carried by stream-bred mosquitos, but, in fact, this zone was only moderately malarious. The most malarious part of the country was the dry zone, with an area of more or less broken jungle, where the scanty and uncertain rain that fell in the wet season was stored in embanked lakes and used throughout the remainder of the year to irrigate the crops. During the dry season the rivers and streams were converted into a series of pools which provided nurseries for the *Anopheles culicifacies*, and every year, for about a month after the onset of the rains, there was an increase in malaria. In 1932, a normal year in respect of malaria, there were in Ceylon one and a half million cases—equal to about one-quarter of the population—treated in the hospitals and dispensaries, and 12,000 pounds of quinine and over two million tablets of quinine, costing some £23,000, were distributed free. In the south-western quadrant the country was much wetter, rivers and streams contained running water throughout the year, and though *A. culicifacies* was present everywhere, it was only in small numbers, and relatively harmless swamp-breeding species formed the dominant Anophelinae. But it had lately been realized that even in the wet zone malaria could be of considerable importance, also that it was drought malaria —that is, occurring only in years when the rainfall was exceptionally low, and the volume of water in the rivers so reduced that they were broken up into a series of pools.

The south-west monsoon failed in Ceylon last year, and there was considerable drought from May to October. At the end of September the Medical Department sent a warning notice to health officers in the wet zone, urging them to see that there were adequate stocks of quinine. A definite increase in dispensary attendances was soon noted, alike in the dry zone in the north and the wet zone in the south. During October there were occasional days of heavy rain, and even minor floods, so that innumerable temporary breeding places were created in pits and quarries and shallow wells of all kinds. The rain was not sufficient to flush out the rivers and was succeeded by further drought, so that more perfect conditions for the multiplication of *A. culicifacies* could scarcely have been devised.

The lecturer described a five-day tour of the epidemic area which he undertook at the end of December. Everywhere along the roads people were trailing to the dispensaries with their bottles or were being carried in litters or bullock carts. The dispensaries were surrounded by dense crowds, many of the people shaking and vomiting with malaria. At the hospitals, where temporary wards were rapidly set up, doctors, apothecaries, and nursing sisters all looked wretchedly ill, and were obviously overworked. The attendances at the dispensaries in December were tenfold what they had been in October. The area affected was about 5,000 square miles, one-fifth of the area of Ceylon, but towards its southern limits the epidemic was quite mild. In the affected area were two towns, Chilu and Kurunegala, where antimalarial measures had been carried out for a number of years. The first of these towns, at the time he visited it, seemed to be holding out well, but in the other, where the control measures were only being carried out over half a mile radius from the centre of the town, they failed to give protection, and the town was badly hit.

CLINICAL FEATURES

The dominant form of malaria was benign tertian; malignant tertian formed only 10 per cent. of the cases, and that percentage did not change during the epidemic. Quartan malaria was rare. At the Colombo General Hospital, where many severe cases were drafted in from surrounding districts, 90 per cent. of the cases were malignant tertian. Here the verandas were occupied by convalescents, and the wards were filled with comatose cases, while in the courtyard were numerous hearses to carry away the dead. The case death rate in the hospital was 7 per cent., but the same severity did not obtain elsewhere, and in the heart of the epidemic area a hospital with over 2,200 cases in the wards had only sixty-four deaths—a case death rate of under 3 per cent. —while, of course, the vast majority of the cases were treated as out-patients. The total number of deaths for the fever group of diseases for the whole of the island during the three months which included the epidemic was 38,090, which, he thought, indicated a case mortality of something like 1.5 per cent. Two clinical features everywhere noticed were the great number of cases with dysenteric symptoms and the number of children with oedema of the legs and face.

MEASURES FOR CONTROL

With regard to the system of control, early in December the Medical Department organized sanitary inspectors to travel the districts collecting information as to incidence and economic condition and telling people where to go to get medicine, but issuing quinine themselves only in urgent cases. On the basis of their daily reports temporary treatment centres were established, with the object that as far as possible no patient should have to go more than a mile or two to obtain quinine. Even in the mass treatment of malaria, however, it appeared that more was required than the doling out of drugs, for in many cases the people would neglect the treatment centres in their immediate vicinity and go six or seven miles to some dispensary where they had faith in the doctor. The same drought which caused the malaria brought about failure of the rice crop, with considerable destitution, and it was evident that relief would have to be undertaken on a more extensive scale than was contemplated. Would it have been possible to prevent the epidemic? To have prevented the breeding of *A. culicifacies* over three hundred miles of river and an indefinite area of streams by canalizing and oiling the pools would have been a far vaster undertaking than anything so far attempted for the control of rural malaria. Dr. Wigglesworth added that his report was necessarily only superficial and preliminary; he had spent only ten days in Ceylon. But he felt that the Ceylon Medical Department organized the distribution of quinine and the extension of the facilities for treatment with a rapidity and smoothness which had not received the commendation it deserved.

The Belgian Medical Society of Physical Education and Athletics is arranging an international conference at Brussels, from June 30th to July 3rd, in connexion with the Journées Médicales de Bruxelles. Professor J. Demoor of Brussels will open the conference with an address on the role of the medical practitioner in physical training, and the three chief topics for discussion are: the early diagnosis of cardiac disturbances, motor tests in physical training, and cycling. Members of the conference will have the same social and other privileges as will be accorded to those attending the sessions of the Journées Médicales. The subscription for membership is 100 Belgian francs, and further information may be obtained from the conference secretary, Dr. E. Rebuffat, Rue de l'Abbaye, 50, Brussels.

British Medical Journal

SATURDAY, MARCH 23rd, 1935

THE TUBERCLE VIRUS

Even to the casual student of tuberculosis it must appear significant that fifty years after the discovery of the causative organism problems in the aetiology of the disease still remain. Koch's postulates constituted so solid a foundation for the tubercle bacillus that when Fontès in 1910 described a filterable form his work hardly attracted any attention. In 1922 Vaudremer claimed to have obtained similar results, but he looked upon this form merely as one phase in a biological cycle of the tubercle virus, a conception already brought forward by other authors. Since that time numerous workers in France and elsewhere have been indefatigable in publishing evidence in favour of the existence of this filterable organism, labelled *ultravirus tuberculeux*. It was originally claimed that microscopically invisible elements passing through an L_3 Chamberland filter could be obtained from the sputum, pathological fluids, and blood of tuberculous individuals—even in the absence of tubercle bacilli—and also from patients with rheumatism, nephritis, purpura, etc. The virus could not be cultivated, but injected into guinea-pigs the filtrate caused a prolonged illness characterized by cachexia and slight enlargement of the lymphatic glands as the only obvious pathological change after death. Other changes occurring less commonly have been reported since. In these glands prolonged and careful search would discover acid-fast organisms and granules, which after many animal passages eventually produced typical tuberculosis. Moreover, a guinea-pig infected with the ultravirus gave birth to young which died shortly afterwards of cachexia, and in them the virus could also be identified, as it could in infants (of tuberculous mothers) dying of general causes.

Of the more recent work on the subject, some of which is discussed elsewhere in this issue by Fraenkel and Pulvertaft, who also give an account of their own investigations, may be mentioned the method[1] which consists of injecting an acetone extract of tubercle bacilli into guinea-pigs inoculated with pathological fluids. While otherwise absolutely negative results would be obtained, this technique often leads to the development of caseous lesions said to be due to activation of the ultravirus by the extract. Even the prestige of the Pasteur Institute has not prevented the work from being severely criticized. The main arguments are as follows. (1) L_3 Chamberland filters do allow microscopical organisms to pass. The different results of various workers may also be accounted for by the numerous physical factors regulating filtration. Positive results would thus be attributable to very few mildly virulent tubercle bacilli or even to some granular biological form (for example, the *poussière tuberculigène* of Jousset).[2] (2) Acid-fast organisms have been reported in the glands of healthy guinea-pigs (according to Petroff in 38 per cent.). (3) It is increasingly realized that many acid-fast organisms exist which may contaminate experimental material. That the bacteriology of the subject is hardly at a stage when it can be applied to the solution of clinical problems was demonstrated at a recent discussion in Paris,[3] when there was almost unanimous criticism of this attempt by Valtis and Paisseau. For instance, the anomaly was pointed out of imputing to an organism so little virulent for the highly susceptible guinea-pig the unexplained deaths of infants born of tuberculous mothers.

The problem of the bacteriology of tuberculosis has, however, also been tackled in another quarter. Impressed by the varying clinical results reported with sanocrysin, Moellgaard conceived that these anomalies could perhaps be accounted for by an inadequate or erroneous knowledge of the cause of the disease. A long paper just published[4] contains details of the work he has carried out during the last few years to elucidate this problem. He claims to have isolated both from cultures of tubercle bacilli and tuberculous tissue in animals in man, and from cases of polyarthritis, an organism which he has called *Actinomyces alba polyarthridis*, because of the chalky white colour of the mycelia cultures. It has a vegetative form (that is, segmented mycelia) and two types of conidia, morphologically diphtheroid and streptococcal, each of which can be grown in pure culture. The diphtheroid conidia are sometimes observed to be acid-fast. There is apparently no connexion between the material examined and the type or number of these forms isolated from it. The identification of the actinomyces in the various forms and their differentiation from other organisms (for example, streptococci, *B. coli*, etc.) is made possible by the use of a special stain and a special protein-free culture medium prepared by Moellgaard, and also by the sugar reactions. The actinomyces is not a saprophyte and has definite pathogenic characters. In laboratory animals mildly virulent strains of the vegetative and diphtheroconidia forms produce cachexia, broncho-adenitis, serositis, and, when highly virulent, lesions closely resembling those of acute rheumatic fever in man. The streptoconidia cause mainly broncho-adenitis and tubercle-like nodules in the lungs, liver, and spleen. Moellgaard marshals the evidence indicating that this organism does not represent biological varieties of the tubercle bacillus but a distinct organism, thus retracting the conception put forward in earlier preliminary papers.[5,6] The actinomyces often lives in symbiosis with the tubercle bacillus, infection with both organisms producing much more extensive lesions

[1] Nègre, Valtis, Van Deinse, and Beerens: *Presse Méd.*, 1932, xl, 1946; and 1933, xli, 1471.

[2] *Presse Méd.*, 1934, xlii, 1305.
[3] Ibid., 1934, xlii, 1213.
[4] *Beitr. z. Klin. d. Tuberk.*, 1934, lxxxv, 616.
[5] Ibid., 1931, lxxvii, 83.
[6] Ibid., 1932, lxxix, 515.

than with either: enormous destructive caseation results in rabbits from the interarticular injection of both organisms. He believes infection with the actinomyces to be widespread, indicated by skin tests obtained with the absolutely protein-free toxin of the organism.

At this stage it would be idle to follow Moellgaard in the application of his findings to the clinical problems of tuberculosis. Suffice it to say that he considers the actinomyces responsible for rheumatoid polyarthritis and probably for some cases of rheumatic fever ; and that tuberculosis is due either to the tubercle bacillus alone or to both organisms living in symbiosis, the latter causing cold abscesses, caseous pneumonia, and processes like epituberculosis, thought to be "non-specific" allergic phenomena. Finally, it is of interest to note that according to Moellgaard there is ample justification for believing that the results obtained by other authors with the filterable virus and other biological phases of the tubercle bacillus can be accounted for by the various forms of his actinomyces. In view of the numerous pitfalls attending bacteriological research in tuberculosis, and the well-known ubiquity of the actinomyces group in nature, the expert bacteriologist will no doubt require answers to several questions before attempting to confirm or refute Moellgaard's findings. The less specialized observer, confronted with the whole mass of work discussed in this article, finds it somewhat difficult to believe that it can all represent bad technique and faulty interpretation ; rather is he left with the impression that we are being offered the various pieces of a jigsaw puzzle—some perhaps still missing—which need putting together before a correct view of the whole is obtained.

ELECTRICAL ACTIVITY OF THE NERVOUS SYSTEM

The association of physiological activities of various kinds with changes in potential is widely recognized, and in certain cases the interpretation of these potential changes may serve as a basis for diagnosis of morbid processes. We have long been accustomed to looking upon the nervous system as an immensely complicated network for the reception, transmission, and interpretation of different stimuli for the adjustment of the organism, both to its external environment and to internal requirements. The two great divisions of the nervous system into the cerebro-spinal and the autonomic correspond to what French physiologists call the *vie de relation*, and the *vie de nutrition*. With the great advances in the quantitative and graphical recording of small potential changes it was natural to seek for evidences of such changes in active nerve tissues. The transformation of mechanical energy applied, for example, to a sensory nerve ending into electrical energy offered no theoretical difficulty, even though great obscurity might still surround the question of how such a change might be brought about. In the case of the sensory nerve, action potentials could be detected in the nerve trunk when the sensory ending was submitted to tension. Study of these action potentials shows that the energy liberated in the nerve fibre and the sensory ending itself is not of a continuous kind, but occurs in a series of jerks or volleys. The more powerful the stimulus the greater the number of volleys per unit time.

Interesting and fruitful as are the experiments and results on sensory fibres, they are not far removed from what might have been considered probable for a complex system of signalling such as that presented by the nerve fibres. More striking is the fact that it has now become clear that there are cell groups in the brain which are so adjusted that spontaneous periodic discharges occur. The respiratory centre discharges rhythmically even when no afferent rhythm is in action to drive it. Records taken from an animal's cortex demonstrate that under light anaesthesia rhythmic discharges are constantly taking place, and that according as these are in or out of phase the resultant waves in the oscillograph records are large or small. In the conscious animal these waves may be very irregular. In a recent paper Professor E. D. Adrian[1] shows that in the rabbit's cortex *regular* potential changes occur at a rate of about three or four a second when the animal is under light chloroform anaesthesia, but when the anaesthesia is deep the discharges are liberated only about once a second—that is, when the question of reception of sensation in the cortex is completely eliminated and no efferent impulses can be sent to the muscles. It appears, therefore, that when free from the disturbing element of afferent impulses the cortical neurons (or perhaps, as Adrian points out, a subcortical centre) discharge rhythmically, and tend to manifest their characteristic rhythm in proportion as they are freed from the complex patterns of external stimuli. The use of the anaesthetized animal is, as ever, a factor introducing doubt as to the universality of application of the results.

In the paper referred to, and in another with Matthews,[2] Adrian considers the evidence for spontaneously discharging nerve cell groups as demonstrated in certain experiments by Hans Berger. The latter observer found that electrical oscillograph records, obtained by leadings off from needle electrodes piercing the scalp of human subjects, revealed a regular series of waves with a frequency of ten per second when the subject was at rest with his eyes closed. With the eyes open, or on the attention being fixed, the waves disappeared, and Berger attributed them to action potentials in the brain. This work was completely confirmed by Adrian and Matthews, and they have satisfied themselves that the waves are not due to artefacts arising from action currents in muscles or from electrical phenomena which arise as a result of eye movements. Whereas Berger was of the opinion that these waves arise from a sort of general activity in the cortex, Adrian believes that they are due to the activity

[1] *Arch. Neurol. and Psychiatry*, 1934, xxxii, No. 6
[2] *Brain*, 1935, lvii, Part IV.

of a group of cells in the occipital part of the brain. From both normal and laterally trephined skulls these workers were able to demonstrate a localization of the effect in the occipital region. It was found to be unnecessary to keep the eyes closed to elicit the waves, provided that, by enclosing the head in a dark box, visual attention was not aroused. Whilst minor degrees of attention with closed eyes will not eliminate the rhythm, full engagement of the attention will abolish it. Whereas visual activity of very slight degree will remove the Berger rhythm, concentrated non-visual effort is required to bring about the same effect. That the phenomenon is closely connected with vision was shown by exposing the eyes to a flickering field of large area, when the frequency of the Berger rhythm tended to adopt that of the flicker.

How are these observations to be explained? Clearly the phenomenon is in the nature of a release of some rhythmically discharging area from the influence of other complicating discharges. This is supported by the close analogy between records from the cortex of the anaesthetized rabbit before and during afferent stimulation and the Berger rhythm before and after opening the eyes. Adrian puts forward the view that this rhythm is due to the spontaneous beating of a part of the occipital lobe. When undisturbed the neurons in this region (not the striate region) are considered to discharge periodically and to co-operate when not interfered with. This synchronism of individual cells is most profoundly disorganized by visual reception, but other forms of attention will do the same thing. Adrian considers that a similar process may be going on in the cortex in general, but has been most readily demonstrated in the case of the visual area for man because of the enormous part played by this sense in the human subject. It is not clear yet how these new facts will affect our knowledge of cortical activity, nor indeed whether the minute changes of potential recorded are in any way significant in the great problems of thought processes.

RESUSCITATION BY CARDIAC INJECTION

Few cases are on record of resuscitation after clinical death, a condition which may be defined as one in which respiration and the heart-beat, so far as can be judged by auscultation, palpation of the pulse, and sphygmomanometry, have ceased. C. Laubry and R. Degos[1] have recently published their electrocardiographic observations on a series of patients, relating to the terminal phenomena in the heart and the possibility of restarting the beat with intracardiac injections of adrenaline. Tracings taken on five patients dying of various maladies demonstrated that after clinical death some cardiac activity could be registered, the duration varying from six to twenty minutes. In all cases evidence of auricular activity disappeared first, the P wave before its final disappearance becoming flattened and the conduction time from auricle to ventricle prolonged. The ventricular complexes recorded after clinical death occurred at long intervals and showed gross deformity, in contrast to their essentially normal form up to the time of death. In one instance the tracing revealed as the terminal event a wavy outline suggesting ventricular flutter or fibrillation. At intervals of one to twenty-one minutes after all post-mortem electrical activity had ceased an intracardiac injection of adrenaline was given into the heart in doses of 2 to 15 mg., and in four of the five cases renewed electrical activity became evident. In no case did a normal auriculo-ventricular complex reappear; in two, ventricular complexes only were seen; and in two others, waves suggesting independent activity of the auricles and ventricles. Their duration was short and never exceeded two and a half minutes, and while the waves were abnormally shaped they usually approximated more to the normal than those recorded after clinical death and prior to the injection. It was noted that the small dose of adrenaline (2 mg.) seemed to be as effective—if not more so—in stimulating renewed activity as the larger dose (15 mg.). The action of adrenaline in stimulating the arrested heart has recently been discussed in these columns, and there is evidence that it is not the drug that stimulates but the mechanical effect of the needle puncture. It is therefore unfortunate that no control observations on the effect of simple puncture of the heart were made by Laubry and Degos. Their investigations were made on cases of fatal disease of the heart and other organs in which there was no question of permanent resuscitation, but it is otherwise when there is cardiac standstill during anaesthesia or in the newborn. Many drugs have been injected into the arrested heart, with results that are not certainly inferior to those obtained with adrenaline. Moreover, the publications of A. S. Hyman in America suggest that simple puncture with a suitable needle is equally good. All parts of the heart have the property of excitability—that is, the property of responding by contraction to various stimuli. In cardiac massage we have an example of a mechanical stimulus, sometimes effective in restarting the heart. Injections for cardiac arrest have usually been made into the ventricle, but it is obvious that if these initiate ventricular contractions the rhythm will be ventricular extrasystolic and not the normal auriculo-ventricular sequence. Hyman's work suggests that the ectopic-ventricular rhythm is at first extrasystolic, which is fairly effective from the circulatory point of view, but that later this may be succeeded by ventricular flutter and fibrillation, in which conditions the heart is useless as a pump. On these grounds there is something to be said for attempting to restart contractions by puncturing the right auricle, the chamber in which the contraction of the whole heart normally originates. If abnormal rhythms do develop in the auricle the ventricular contractions are nevertheless effective. At the present time, with the action of adrenaline remaining uncertain, the clinician will probably continue to inject this drug, if available, into the arrested heart, but a preliminary simple needle puncture can be accomplished with a saving of time, and may by itself have the desired effect.

[1] *Rev. de Méd.*, December, 1934, p. 539.

DIPHTHERIA AND PROPAGANDA

Few medical men, we imagine, realize fully the debt they owe to the small devoted band of their colleagues in the Research Defence Society who carry the main burden of meeting the attacks upon medical research by various wealthy "anti-vivisection" societies. It is a battle of pence against pounds. Special pleading, the intentional adroit emphasis on favourable points and silence on those unfavourable to a hypothesis, is a highly skilled business. Advocacy is no part of the training of a medical officer of health or a research worker whose one aim is truth, and either of those medical men will find it a time-consuming occupation to meet the selected arguments of those opposed to medical research. This task is efficiently done for him by the Research Defence Society. The arithmetically inclined will be diverted by calculating how many pennies per head of the medical profession the total income of the society represents; the dispassionate observer will be struck by the small percentage even of those giving up their lives to medical research, and holding the necessary licences, who think it a duty to subscribe. The latest issue of the society's quarterly journal[1] contains a most serviceable article by Sir Leonard Rogers, who has given generously of his leisure to a review of active immunization against diphtheria, based partly on Dr. Graham Forbes's comprehensive book. Here the busy medical officer of health will find figures to satisfy the councillor seeking information. He will also find that the Health Committee of the League of Nations, the Chief Medical Officer of the Ministry of Health, the statistician Godfrey after analysis of the American figures, and the critical immunologist Topley, are all convinced of the high utility of active immunization in large communities. He will find that diphtheria, which was a scourge in fever hospitals in pre-inoculation days, affecting from 5 to 15 per cent. of the nurses annually, has been almost abolished by systematic testing and inoculation. He will discover that the huge Metropolitan Life Assurance Society in America considers it sound business policy to pay for expensive whole-page advertisements in popular magazines urging active immunization against diphtheria. In England the Wesleyan and General Assurance Company distributes a useful leaflet on the subject, and several years ago showed a film in which Schick himself appeared. Two English films are at the disposal of medical men on payment of small fees, one by Dr. E. T. Nash, and a recent one by Drs. G. Bousfield and R. King Brown. We would commend, in passing, the cautious wording of the "certificates" issued by Dr. Nash for children inoculated and proved later to be Schick-negative. It does not promise *complete* protection. Unfortunately much controversy in the past has centred around the words "Schick-negative" and "immune." When is a person "immune"? Probably the correct retort is: "When is a Navy or an Air Force adequate?" Though, for didactic purposes we use the words "immune" and "non-immune," we cannot divide our inoculated children into "blacks" and "whites"; there is every shade of intermediate grey. Some inoculated people may contain in their blood 50 units of antitoxin per mil, others one five-thousandth of this amount (H. J. Parish and J. Wright[1]). Obviously the former has an incomparably lower chance of being attacked by even the most aggressive "gravis" type of diphtheria than the latter, and it is presumably those with a low antitoxin content who furnish the rare cases of implantation of true diphtheria bacilli in the throat—that is, "diphtheria" in Schick-negative subjects. It is a curious reflection that the results of S. F. Dudley and his colleagues are being used to discourage campaigns of active immunization. Dudley states that higher virulent carrier rates were recorded than had ever been obtained before artificial immunization in the school at Greenwich, but adds at the end of these observations a special caution that they must not be considered as of general application. Killick Millard[2] quotes, from Dudley's report, American figures in favour of the hypothesis that mass inoculation creates carriers and causes an increase of diphtheria among the inoculated. On this point R. A. O'Brien,[3] evidently rather disturbed by Dudley's hypothesis, said at Bournemouth in July last:

> "I wrote to a number of leading authorities in the U.S.A. asking what their experience had been, and received permission from E. S. Godfrey and W. W. Lee and others to say that they were impressed with the fall which follows immunization, and that, so far as their experience and consideration of American figures formed a guide, they found no evidence that the morbidity or mortality rises even temporarily in a partly immunized community because of the suggested rise in carrier rate among the inoculated."

[1] *The Fight Against Disease.* Vol. xxiii, No. 1. 1935. Macmillan and Co., Ltd., St. Martin's Lane, W.C.2. (6d.)

PAROXYSMAL HYPERTENSION

Attacks of paroxysmal or temporary hypertension occur chiefly in two conditions. First, in patients presenting chronic hypertension of the essential or idiopathic type the pressure may rise abruptly to a higher level. While this may sometimes cause little disturbance, it is associated in other cases with local cerebral derangements such as monoplegia, aphasia, or amaurosis, and may precipitate congestive cardiac failure, angina pectoris, or pulmonary oedema. Secondly, it is a striking symptom of certain tumours of the suprarenal gland. These conditions are dealt with by a number of authors in a recent discussion[4] on paroxysmal hypertension. There is agreement that the local cerebral disturbances, or "cerebral eclipses," which may accompany the paroxysm are due to a local vasculat spasm, but opposing views are expressed as to whether the cerebral spasm is the primary event or secondary to a generalized vaso-constriction. The latter would appear to be a more reasonable view. Attacks of hypertension are a well-known symptom of the rare but highly significant paragangliomas of the suprarenal medulla. Tumours of the suprarenal cortex may also produce a chronic hypertension, but it is said that here the hypertensive crises are lacking. The French school appears to be unanimous in believing that the typical attacks of the medullary tumours are due to a release of adrenaline into the circulation; the hyperglycaemia, increase in the red and white blood counts, tachycardia,

[1] Parish, H. J., and Wright, J.: *Lancet*, March 16th, 1935, p. 600.
[2] Millard, C. K.: *Medical Officer*, March 2nd, 1935, p. 85.
[3] O'Brien, R. A.: *British Medical Journal*, 1934, ii, 712.
[4] *Bull. et Mém. Soc. Méd. des Hôp. de Paris*, December 3rd, 1934.

and tremor, which may accompany the hypertensive attack, are held to simulate very closely the effects of an intravenous injection of adrenaline. Positive results in experiments to determine the presence of adrenaline in the blood during the attack are reported, and also the reproduction of typical symptoms by transfusion into a healthy subject of blood from a patient in an attack. Contradictory results have been obtained by others, however, and the part played by adrenaline must still be considered unproved. At first purely paroxysmal, the hypertension of paragangliomas tends sooner or later to become permanent. In the first stage evidence of impairment of renal function during the attacks is described—namely, albuminuria, cylindruria, and nitrogen retention in the blood. With the occurrence of permanently high pressure chronic renal defect tends to appear, and the patient may die from uraemia. Yet the kidneys usually show very little defect histologically, the glomeruli and vessels being free of those changes seen in chronic glomerulonephritis and in essential hypertension with renal insufficiency. Few suprarenal medullary tumours have been removed, but disappearance of the renal defect has been reported following this operation. The part played by the carotid sinus, now known to be an important factor in regulating arterial pressure, is discussed. Though it is possible to produce a hypertension of considerable duration (but not permanent) by bilateral extirpation of both sinuses, it is concluded that there is at present no evidence to incriminate this mechanism in clinical hypertension. Finally, several interesting examples of various lesions accompanied by attacks of severe hypertension are reported and discussed. These include tumours pressing on the vagus, lesions of the geniculate ganglion, and tabetic gastric crises ; their significance is so far undetermined.

HOUSING IN ST. PANCRAS

In the midst of all the talk and recrimination about the housing of the working classes, one group of enthusiasts has been notable for going ahead and leaving others to discuss academic questions. The St. Pancras House Improvement Society was founded in 1924, and the first ten years of its existence have borne practical fruit in two splendid grey blocks of workmen's flats hard by St. Pancras Station. The land where these stood was not long ago covered by some of the worst slum houses in London—dark, filthy hovels, often underground, damp and draughty in winter, hotbeds of flies and infection in summer. The new buildings have airy balconies and plenty of green open spaces, and the dwellers are charged rents they can afford. This example is now being followed by South-Western St. Pancras, and a site has been bought in Ferdinand Street, Chalk Farm. A block of twenty flats is projected, at a cost of about £8,000, to rehouse families from clearance areas and condemned basements. After this block has been built there is ample scope for enlarging the work. In order to give publicity to the scheme, a meeting was held on March 12th at West Wing, Regent's Park, at the invitation of Miss Maud Allan. Visitors saw a film showing vividly some of the foulest corners in the remaining slums of St. Pancras, and, by contrast, the workmen's new homes in the Somers Town flats. Lady Stewart, the organizing secretary, presided, and Mr. Basil Ward, a partner in the firm of architects which is building the flats, quoted statistics to show that in homes where there are 0.7 persons per room, fifty-eight babies per 1,000 die before their first birthday ; where the congestion is raised to 1.15 per room, the number of deaths under 1 year old is ninety-three. He said that the essentials of healthy housing were freedom, no overcrowding, surrounding open spaces, facilities for cleanliness, and the segregation of cooking and washing from the living rooms. Miss Mary Borden, in a trenchant speech, declared that the problem of the poor is the simple one of how to keep alive ; they are not concerned even with such apparent necessities as fresh air and cleanliness. The State already recognizes the right of every citizen to food and shelter ; the right to decency should also be recognized. To respect this right is one of the chief aims of the society. Miss Borden pointed out that the society is a sound business proposition paying 3 per cent. on the ordinary shares and 2½ per cent. on the loan stock. But beyond dividends it yields an immense repayment in human life and happiness, and now that St. Pancras has shown the way others will undoubtedly follow.

CONGENITAL DISLOCATION OF THE HIP

Open operations for congenital dislocation of the hip received unusual attention at the annual meeting of the American Orthopaedic Association held in July of last year. Three papers[1 2 3] were devoted to discussion of the superiority of the open operation as opposed to closed reduction in certain groups—indeed, in the majority of cases. The conclusion reached is admirably stated by Farrell, who says:

> "A closed reduction is the operation of choice in infants younger than 1 year. There is a fair chance of success with a closed manipulation in children between 1 and 3 years of age. Accordingly, in this age period, a single gentle manipulation may first be attempted when it is not obvious that such a procedure would be hopeless . . . With increasing age the relative chance of failure of closed reduction becomes greater, and the open operation is the treatment of choice for the surgeon who is in a position to perform it satisfactorily."

In the several descriptions of operative technique there was an encouraging unanimity among surgeons from widely separated American centres as to the essentials of the operation. The important features are: (1) an approach of the Smith-Petersen type ; (2) stripping down of the stretched capsule from the ilium ; (3) removal of the ligamentum teres if it is found to obstruct reduction ; (4) removal of fibrous tissue from the acetabulum if present, but the avoidance of deep gouging (which invariably leads to more or less permanent stiffness of the joint) ; (5) division of the infolded portion of the capsule below the femoral head—the so-called "hour-glass" constriction ; and (6) the creation of a bone shelf superiorly in any case where the acetabular roof is found to be defective. Yet even in the hands of enthusiasts the open operation did not yield more than about 75 per cent. of successes, and it seems curious that a report on such an extensive symposium should not include more than a passing

[1] Stewart, F. S.: *Journ. of Bone and Joint Surg.*, 1935, xvii, 11.
[2] Kidner, F. C.: Ibid., p. 28.
[3] Farrell, B. P., and Howorth, M. B.: Ibid., p. 35.

reference to the overwhelming importance of the early recognition of the congenitally dislocated hip. Even the best American figures for the open operation (the superiority of which is questioned in this country) look rather poor in comparison with Putti's figures for closed reductions in cases recognized early. His figures are in the region of 97 per cent. of successful reductions. In this country we are fortunate in having a huge network of infant welfare centres which should lead in time to the prompt recognition of all cases of congenital dislocation. Admittedly the conditions are not quite the same as those in Italy, where congenital dislocation of the hip is exceedingly common and where almost every mother is anxious to ascertain whether or not her child's hips are normal. Nevertheless, the recent experience at one large English orthopaedic hospital is that the cases are sent to orthopaedic clinics at a much earlier date than formerly, and the percentage of successful closed reductions is slowly rising. Valuable as the open operation may be, the fact that it has to be performed at all is a partial confession of failure, and the future of the treatment of congenital dislocation of the hip lies in a wider recognition of the importance of early diagnosis.

JUNG'S INFLUENCE ON CLINICAL PSYCHIATRY

The name of C. G. Jung is familiar to everyone who takes any interest in psychological problems as one of a trio of pioneers, of whom the others are Freud and Adler. Freud's contribution to clinical psychiatry is represented in this country by many practitioners of both sexes, by active and growing societies, and by more than one clinic at which his methods are exclusively practised. The contribution of Adler, though it has not attained the same outward proportions, is none the less quite definite, and his exponents are sufficiently numerous and eminent at any rate to make their views unequivocally heard in the psychiatric world. By contrast, Jung's contribution is elusive. He has founded an important school of psychology ; he has a large following in many other countries ; but when one searches for indications of his direct influence in English medicine one is soon baffled. No society bears his name, and those who profess to treat patients specifically by his methods or to expound his doctrines can be numbered on the fingers of one hand. On March 12th this year the Section of Psychiatry of the Royal Society of Medicine held for the first time a meeting devoted to his work, and Dr. Murdo MacKenzie opened a discussion on Jung's contribution to clinical psychiatry. Anyone who attended the meeting hoping to find out what Jung means to English psychiatry must have come away with the depressing conviction that Jung's contribution to psychiatry in this country is negligible. Dr. MacKenzie read a brilliantly argued paper showing the correspondence of Jung's two main types, the introvert and extravert, with other pairs of opposites in the various fields of mental activity. The extravert he held to be the man with the immediate reaction as against the logical one, whose contribution to the community is civilizing rather than cultural, whose attitude to the environment is social rather than individual, whose creative bent is romantic as opposed to classical. He laid stress on only one of Jung's many contributions to psychiatric thought—that is, his advice to the introvert to set a proper value on the characteristics of his own type, and not to be led away, to his own undoing, into competition with an outwardly orientated world. Thus Dr. MacKenzie acknowledged the help of Jung solely in regard to the thinking introvert, one only of Jung's eight types, and he gave little indication of how the psychological types can be applied in the consulting room or the clinic to the immediate problems of the psychiatrist. Moreover, he was frankly limiting his inquiry to the treatment of the neurotic, not of the psychotic, with whom the large bulk of psychiatric science is concerned. The student might then have expected Dr. H. G. Baynes to complete what Dr. MacKenzie had begun, and to give a wide-angle view which would supplement the narrow-angle picture presented by his colleague. Beyond, however, mentioning the chief point of distinction between the extravert and the introvert in their respective orientation to the subject and object, and Jung's description of the independent activity of the psyche as a purposive organism, he went no farther towards explaining what Jung had done to assist the work of curing the mentally afflicted. Is it, therefore, to be assumed that Jung has really made no contribution to clinical psychiatry in this country? The truth probably is that, except for a few early papers, Jung has never written directly on the subject of clinical psychiatry.

A RACIAL SURVEY OF BRITAIN

The Royal Anthropological Institute proposes to undertake a racial survey of the past and present populations of Great Britain, and a letter appealing for donations in aid of this purpose appeared in *The Times* of March 13th ; the majority of the signatures to it are those of anthropologists. Money is needed to enable trained workers to measure living people and skeletons preserved in various museums, to reduce the data they would collect, and to aid the publication of technical reports and popular summaries dealing with the results obtained. It is believed that such a survey would be of medical and sociological as well as of anthropological importance. An adequate knowledge of the present racial constitution of the population of this country should certainly assist in the interpretation of problems such as those of the regional differences found in the incidence of various diseases. Donations may be sent to the honorary treasurer of the Institute at 52, Upper Bedford Place, London, W.C.1.

YOUTH AND SOCIAL HYGIENE

Ten years ago the British Social Hygiene Council widened the scope of its work to include positive health teaching for the younger generation and for those responsible for its training. We publish this week at p. 619 a letter asking for the co-operation of members of the medical profession in ensuring the success of the Council's appeal for funds to continue and develop this important educative work. Many of the lay public may turn to their medical advisers for guidance when this appeal reaches them. If our readers recommend their patients to give generous support the success of the appeal will be assured.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the major medical disorders met with in general practice

THE TREATMENT OF MEASLES

BY

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The practitioner who has not already done so should occasionally visit the fever hospital to which he sends his measles patients. His aim should be to reproduce in the home, as far as practicable, the conditions which obtain in hospital; if they fall far short of this standard the patient is best removed to hospital forthwith. The sick-room should be large and airy, well ventilated, and warmed by a coal fire. Heating by radiators and hot-water pipes, or by gas and electricity, are equally unsuitable. The former interfere with the free circulation of the room atmosphere, leaving the patient in a warm, saturated air-pocket in which he must perforce remain, while the latter dry the air unduly, producing a state which is highly irritating to the inflamed respiratory tract. A temperature of 60° to 65° F. should be maintained; some variation within these limits is an advantage rather than otherwise. It is well to exclude direct sunlight from the eyes while photophobia is present.

All superfluous furniture, including carpets and curtains, should be removed, even the time-honoured disinfectant-saturated curtain over the door. The bed should be placed as near the centre of the room as possible. The bedclothes will be few and light; a single sheet and blanket should suffice, while the patient wears a single cotton nightshirt opening at the sides. Contrary to common opinion, the measles patient does not readily catch a chill during the pyrexial phase, and it is unnecessary to wrap him up tightly with blankets. Adequate warmth is readily provided by hot-water bottles. If it is found difficult to maintain the requisite room temperature and the patient feels cold, a loose woollen vest may be worn, but a Gamgee or pneumonia jacket is unnecessary.

General Hygiene and Nursing

The patient is washed completely once a day, and, in addition, tepid-sponged at intervals of from once daily to four-hourly. The temperature of the water and the frequency of sponging depend upon the amount of restlessness and insomnia or the degree of pyrexia. The buccal and upper respiratory passages must be cleansed gently and at frequent intervals, as secretions, epithelial debris, and food particles collect in various situations. The buccal cavity is usually best dealt with by inserting the index finger enveloped in cotton-wool moistened with warm sodium bicarbonate solution. In very young and refractory children this procedure is not free from the risk of damaging the delicate and inflamed mucous membranes; any breach of continuity of the mucosa might permit the ingress of pyogenic organisms, and the manipulation should be omitted if there is any possibility of damage being inflicted. The mere act of swallowing quantities of dilute fruit juice, especially lemon juice, at frequent intervals is by itself usually effective in keeping the oral cavity clean and sweet. This may be aided by a simple prescription containing a small amount of potassium chlorate taken internally for a few days. This substance appears to have a specific action in alleviating stomatitis and preventing ulceration of gums, tongue, and lips, and reaches all the affected parts only by swallowing. An agreeable mixture—30 minims four-hourly, for a child of 1 year, for three or four days only—is:

℞	Pot. chlor.	gr. x
	Ac. hydrochlor. dil.	♏ x
	Syrup.	ʒ j
	Aq.	ad ℥ j

Any attempt at gargling is impossible in the great majority of cases. The glycerin preparations commonly prescribed should never be employed on account of their marked hygroscopic action on the inflamed epithelial tissues; they tend to produce or aggravate the ulcerations and fissures they are meant to prevent. The lips should be protected by the application of vaseline, alone or in equal proportions with ung. hydrarg. ammon. dil. The toilet of the nares and nasopharynx is equally important in the prevention of septic complications, including bronchopneumonia. It is important not to do too much; simple removal of discharges and cleansing of the anterior nares with alkaline solution, followed by application of the protective emollient mentioned above, usually suffice. The nasal douche should never be employed in the acute coryzal stage, and is preferably reserved for cases of persistent rhinitis with purulent discharge or crust formation. The solution should be at body temperature, and applied by gravity by means of the douche can, not more often than twice a day. A suitable prescription is: sodium chloride, borax, sodium bicarbonate—two grains of each to one ounce of water. Older children may profitably be taught to blow their noses, provided they do not do so too violently.

The patient should have few visitors. The ideal arrangement is that he is seen only by those actually tending him. Nobody with acute or chronic catarrhal infection should be allowed in the room, or else a mask should be worn. The utmost care should be taken that all articles of food and drink, and all utensils and clothing, should be prepared and handled in a cleanly manner. All discharges and soiled articles from the patient should be disinfected forthwith by burning, boiling, or immersion in disinfectant (carbolic 1 in 40 or lysol 1 in 20).

Conjunctivitis of some degree is invariably present in measles. The mildest grades require no special treatment, apart from application of ung. acid. boric. to the lids at night. In more severe grades irrigation with boric lotion (4 grains to 1 ounce) with the undine at intervals from twice a day to hourly, according to severity and amount of purulent discharge, with application of ung. acid. boric. to the lids after each irrigation, usually clears up the condition in two to three days. The more popular ung. hydrarg. ox. flav. should not be employed, or only at quarter strength, as it is usually too irritating for the conjunctivitis of measles. In more protracted or subacute infections irrigation with hydrarg. perchlor. 1 in 10,000, or with zinc sulphate 1/2 per cent., may prove more efficacious in promoting complete resolution.

The Diet

The onslaught of the measles virus falls mainly upon the respiratory and the gastro-intestinal tracts, and special attention to these passages is necessary in sickly or debilitated subjects in order to avert dangerous complications. During the winter months respiratory complications are most common, while in the spring and summer months enteritis is to be dreaded most.

Almost the whole gastro-intestinal tract is affected by the causative virus, initiating an inflammatory catarrh, which, if not promptly checked, may quickly lead to severe entero-colitis from invasion by secondary organisms. In the milder grades cows' milk, suitably diluted with water according to age, or with lime-water if there is diarrhoea, given at three- to four-hourly intervals and supplemented between feeds with bland fluids, usually corrects the condition. The usual vague instruction to give, at frequent intervals, small feeds of milk, presumably unaltered, is misleading, and calculated to provoke an intractable enteritis. The feeds should be given at the same intervals as prior to the onset of measles, and be adjusted to the body weight and individual tolerance of the patient. Between feeds the fluid intake is maintained by drinks of water, plain or with 2 to 5 per cent. of glucose, and flavoured with lemon or orange juice. The practice of giving plain water warmed to body temperature is apt to produce nausea and vomiting in many subjects, but this aversion is removed by flavouring the drink with fruit juice. A pinch of common salt is a useful adjuvant, stimulating both appetite and thirst. Many children have a rooted distaste to milk, plain or diluted, but will take it readily when flavoured with tea or coffee or when suitably modified—for example, Horlick's malted milk.

Beef tea and meat extracts are always best avoided in the first week, especially if there has been a tendency to diarrhoea, as they are apt to excite gastro-intestinal irritation. If milk is not well tolerated, as shown by the persistence of diarrhoea or the appearance of curds, it should be citrated or, preferably, peptonized ; or it may even be omitted altogether for twenty-four hours, and measures directed towards rectifying the gastro-enteritis be applied forthwith. The great majority of patients, with a suitably adjusted dietary, rapidly regain their wonted appetite, and may be placed on full diet as soon as the temperature is normal. A generous diet is advisable, supplemented by cod- or halibut-liver oil for some months.

Specific Measures

So far we have discovered no specific of proved value in the treatment of measles. The number of so-called "specifics," some of which have enjoyed a reputable vogue, must be legion, but none of them has stood the test of time or of critical investigation. Various antipyretic drugs are still employed in many quarters, especially on the Continent and in America ; of these amidopyrine has been the most popular in recent years. In full therapeutic doses (1 grain for each year of age to a maximum of 5 grains, at four-hourly intervals until defervescence), it certainly curtails the duration of the disease, or, at least, of the pyrexial phase ; but it does not appear to have any mitigating effect on the severity of the infection or upon the incidence and gravity of complications. Nor should its risks be forgotten. Overdosage is likely to occur if the drug is invariably pushed until the temperature reaches normal, while in certain susceptible subjects a condition resembling or identical with agranulocytosis may be produced.

More success may reasonably be expected to attend the administration of specific immune sera. As the real danger of measles is from the complications which follow in its train, from invasion with pyogenic organisms, we should attempt either to mitigate the severity of the primary virus or to prevent or check the assault of the secondary invaders. The marked success in the attenuation and prevention of measles which followed inoculation with measles-immune sera (convalescent and adult) during the incubation period raised hopes that these measures would prove of value in treatment. In the majority of experiments recorded, 5 to 10 c.cm. of convalescent serum have been given intramuscularly on the fourth or fifth day of the disease ; the clinical results were uniformly disappointing. During a recent epidemic, larger doses of immune serum—20 to 50 c.cm.—have been administered to severe cases by the intravenous route, with demonstrable clinical improvement. The earlier the serum is given the most clear-cut are the therapeutic benefits. The therapeutic scope of measles-immune sera will doubtless be more thoroughly investigated in the near future, when more generous supplies are made available. The recent preparation of highly concentrated placental extracts, rich in measles-immune substances, which have already proved their worth in prophylaxis, give promise of a wider application in treatment.

Usually, patients come under the care of the practitioner at a stage when they are already virus-immune (sixth or seventh day of disease) and not, therefore, amenable to specific antiviral therapy ; but secondary invasions are imminent or perhaps well established. Clinical experience has suggested that a potent anti-streptococcal (scarlatinal) serum, in doses of 20 to 50 c.cm. intramuscularly, is effective in lowering the incidence of faucial angina, ulcerative stomatitis, laryngitis, and even bronchopneumonia. Administration of polyvalent anti-pneumococcal serum, in similar circumstances, has proved consistently disappointing, while an effective antiserum for Pfeiffer's bacillus—the third secondary invader in order of frequency—has not been available in this country.

In view of the known fact that ill-nourished, rachitic subjects stand measles badly, early administration of vitamins A and D, in a highly concentrated state, has been advocated in the hope of reducing mortality and complications. On theoretical grounds the method is logical, and benefit actually appears to accrue in those cases in which vitamin deficiency exists, but it has been found difficult to demonstrate any consistently beneficial action in a series of measles patients admitted to hospital as compared with a control series under identical conditions except that the concentrate was withheld.

Complications: Prevention and Treatment

Under conditions of sound hygiene and nursing complications should be rare. They should be anticipated and averted or treated promptly and energetically as they appear. Too often, however, the practitioner is only called when dangerous complications have arisen, necessitating immediate removal to hospital for satisfactory treatment.

THE RESPIRATORY TRACT

Symptomatic treatment of bronchitis may help to ward off suffocative catarrh or pneumonic consolidation. Space forbids full discussion of the treatment of measles bronchopneumonia ; it differs little from the treatment of pneumonia in children generally, except in its greater severity and higher mortality. Severe attacks of pneumonia are frequently accompanied by some degree of pleurisy, and should pus form diagnostic aspiration is necessary as a guide to subsequent treatment.

Laryngitis, appearing with the onset of the rash, or shortly thereafter, is a dangerous symptom, demanding prompt and energetic action. Anti-diphtheritic serum in doses of 16,000 to 24,000 units is injected intramuscularly without waiting for the result of bacteriological examination, and the steam jet is employed. The steam tent is not used nowadays, and some authorities have abandoned steam in all forms. It is probably wise to omit it if there is any likelihood of pneumonia ensuing, or if it is already manifest. Examination of the larynx and adjacent structures is made by the direct laryngoscope, and smears and cultures are taken. If the results of inspection and of bacteriological examination negative a diagnosis of diphtheria, anti-streptococcal (scarlatinal) serum is given in

doses of 20 to 30 c.cm. Culture plates nearly always reveal the presence of haemolytic streptococci, but their pathogenic role in a given case is not always easy to assess.

Should operative measures be demanded to relieve urgent obstructive symptoms aspiration of mucus or membrane through special tubes (Willard Parker tubes) is the operation of choice, but subsequent intubation is frequently necessary on account of laryngeal or subglottic inflammation and oedema, or when laryngeal spasm is pronounced. The intubation tube is most easily and safely introduced through the laryngoscope by means of a special introducer, such as the model made for me by the Medical Supply Association Ltd. Experience of the various methods has shown that diphtherial cases respond well to suction and intubation, but, when the haemolytic streptococcus is the causative organism, immediate tracheotomy is usually the most successful operation, on account of the special liability to laryngeal ulceration and consecutive bronchopneumonia. If the complication occurs with, or shortly after, the measles attack, the prognosis is grave, whatever method is employed.

GASTRO-INTESTINAL DISTURBANCES

The symptomatic gastro-enteritis characteristic of measles is usually transient, but may be quickly converted into a severe and rapidly fatal form should the warning diarrhoea be neglected. If the usual measures, such as diluting the milk with lime-water or altering it by peptonization, do not improve matters, although supplemented by hyd. cum cret. (1/2 grain for each year of age up to 3 grains, nocte) or by an astringent such as bismuth and chalk mixture, milk in any form must be discontinued. If there is no vomiting fluids should always be taken by mouth. For a child of 1 year two ounces of half-strength normal saline, with addition of 2 to 5 per cent. glucose, is given at hourly intervals for twelve to twenty-four hours ; thereafter full-strength saline is substituted, with added glucose and fruit juice as desired for another twelve to twenty-four hours. If the general and local condition improves whey or secway may be tried cautiously, going on, in a day or two, to skimmed or half-cream Cow & Gate, or like proprietary dried milk. Some children do better on lactic acid feeds immediately after the saline course—either Cow & Gate "lacidac," or, if preferred, two drops of acid. lact. (*B.P.*) per ounce of skimmed cows' milk with added sugar. Small feeds must be taken at the start—for example, one to two ounces for a child of 1 year—but the feeding interval should be the same as before the attack of measles, and the fluid intake made up between feeds by bland fluids. Albumin water is useful to supplement the glucose, saline, whey, or lactic acid feeds.

Drugs have little place in the treatment of the severer gastro-intestinal disorders ; opium is always contra-indicated, and even castor oil has gone out of fashion, but hyd. cum cret. is still used in suitable cases. In collapsed states a good brandy, in doses of 30 minims for a child of 1 year, is frequently invaluable, but should not be employed indiscriminately in gastro-enteritis. If vomiting complicates the picture, fluid must be administered rectally, subcutaneously, intraperitoneally, or intravenously, according to age and degree of intoxication or dehydration. In the worst cases it is best given intravenously by tying a cannula in a vein of the arm or the leg. Feeding by the stomach tube and rectal lavage may be necessary in obstinate cases, but should not be carried out too long.

OTHER COMPLICATIONS

Irrigation with boric acid lotion (5 grains to 1 ounce) suffices to cure the majority of cases of mild purulent conjunctivitis in the course of a few days, but severe or persistent infections require the addition of protargol 10 per cent., or argyrol 5 per cent., once a day, and full dilatation of the pupil, using, preferably, ung. atropin. sulph., 0.25 per cent. For the lids, ung. acid. boric., or quarter-strength ung. hydrarg. ox. flav., should be applied after each irrigation. The appearance of corneal ulceration is a serious complication, but most cases do well, and leave little permanent opacity. Should the ulcer tend to spread or resist the usual measures, the edges should be cauterized with pure carbolic acid or the electrocautery. Even in panophthalmia conservative measures are indicated, as the tendency to useful recovery is striking. Phlyctenular conjunctivitis is more prone to occur during convalescence ; boric acid lotions, dilatation of the pupil, and eye-shade for photophobia, and administration of cod-liver oil and ultra-violet light usually lead to rapid cure.

The health standard of the modern child is probably the determining factor in the diminished incidence of severe buccal complications. The milder grades clear up rapidly with potassium chlorate mouth washes and general hygienic measures. For gangrenous stomatitis (cancrum oris) more heroic measures are imperative. The treatment of otitis media, mastoiditis, paranasal sinusitis, suppurative adenitis, cervical cellulitis, boils, paronychiæ, etc., differs in no essential respect from those conditions arising in other circumstances, except that it is always advisable to defer operative measures as long as possible, to enable the damaged tissues to regain their former vitality and powers of repair.

Convalescence and After-care

Convalescence is generally rapid in the absence of complications, but a generous dietary and abundance of fresh air and active exercise are always advisable. A course of ultra-violet ray treatment, or, better still, a holiday at the seaside or in the country, is helpful in preventing chronic pulmonary catarrh and tuberculosis. Various organizations, such as the Invalid Children's Aid Association, do a valuable service in this respect by providing convalescent and after-care facilities for children whose parents are unable to afford the expense.

Infectivity : Disinfection : Prophylaxis

Measles is infectious from the earliest appearance of catarrhal symptoms or the first rise of temperature, and infectivity is at its height immediately before the onset of the rash. As the rash fades, infectivity is markedly diminished, and is usually completely absent by the twelfth to fourteenth day from the onset of the disease, whether complicated or not. Children are safely allowed up by the tenth day, but, if there is any doubt, a few extra days in bed are advisable in view of the risk of pulmonary complications. Concurrent disinfection of all discharges and soiled articles must be rigorously enforced, as gross contamination may lead to spread of the disease, despite the low viability of the virus. Terminal disinfection may safely be limited to simple cleansing of the room and its contents with soap and water.

Experience has amply proved that we cannot hope to protect the individual or alter the course of measles epidemics by mere isolation of the acutely ill patient. Fortunately, in measles-immune serum we have a safe and reliable agent whereby temporary protection or a modified attack, according to circumstances, may be conferred on individual contacts or on the members of selected communities. The highly specialized technique of measles control is outside the scope of this article. Suffice it to state here that precise adjustment of dosage to body weight and due observance of the conditions governing success have placed in our hands the power, to use if we will, to cheat the measles virus of its prey.

OSTEOPATHS BILL: SELECT COMMITTEE

FOURTH SITTING

The fourth sitting of the House of Lords Select Committee on the Registration and Regulation of Osteopaths Bill was held on March 15th, Lord Amulree again presiding. It was announced on behalf of the British Chiropractors' Association that as those responsible for the Bill were prepared to meet the chiropractors by the insertion of the qualifying clause suggested at the previous sitting (*Journal*, March 16th, p. 546) that body would withdraw its opposition.

Dr. W. K. Macdonald's Evidence Continued

Dr. W. Kelman Macdonald of Edinburgh, who had already given part of his evidence on behalf of the applicants for the Bill, was further examined by Mr. Thorpe, K.C. He agreed that there were some outstanding diseases which could be treated medically. These included syphilis, by arsenic; leprosy; amoebic dysentery, by emetine; and all diseases caused by intestinal parasites, which had their appropriate remedies. The infecting organisms, as compared with the staphylococcus, the streptococcus, and *B. coli*, were rather a "heterogeneous bunch"; indeed, he would not call the amoeba of dysentery or the plasmodium of malaria a germ at all. Even with the administration of these drugs osteopathic treatment could assist, but he admitted that for the complete cure of all these conditions the appropriate medical remedies were necessary. There were also a certain number of medical emergencies which a practitioner of any school might be called upon to treat. These included diabetic coma, treated by large doses of insulin and glucose; acute uraemia, by alkalis and lumbar puncture and venesection; severe tetany, occurring after the too energetic removal of thyroid, treated by subcutaneous injections of parathormone; acute cardiac failure of the non-toxic variety, treated by venesection and strophanthin or digitaline intravenously; severe asthmatic seizure, treated by adrenaline, often with dramatic results; and lastly he would mention the intravenous injections of saline in such conditions as general shock and loss of blood, with or without the use of morphine and atropine, and there was also transfusion of blood. These emergencies, except perhaps the severe tetany, occurred no matter what system of medicine was being practised. With the exception of the cardiac stimulant and the diluting of toxic blood by intravenous injections of normal saline, products of the ductless glands were employed in the medical treatment of these emergencies, and osteopaths admitted the usefulness of these remedies. He could not agree to the inclusion among medical emergencies of such conditions as acute pulmonary oedema and toxic heart, for he contended that in such cases general osteopathic treatment yielded better results than could be obtained by digitalis, atropine, and morphine, although those drugs could and did save life on many occasions.

The Osteopath's View on Serum Therapy

Questioned as to sera, Dr. Macdonald said there was no denying that the appropriate serum in a case of meningococcal meningitis could bring about dramatic cure, but in no other form of meningitis was any serum of value. Then it was difficult to argue with a person who shut his eyes to the value of anti-diphtheritic serum. He felt that, for the rest, serum therapists were justified only in claiming successes in respect of the Flexner serum in cerebro-spinal fever; Wright's vaccine in a small number of cases of boils and acne (with other autogenous vaccines); the immunity treatment of typhoid; vaccination in the prevention of small-pox, though there was much evidence that extraneous poisons were often introduced in the vaccination process; the preventive, but not curative, treatment of tetanus, and treatment of hydrophobia. Ehrlich had abandoned serum research, regarding the field as already completely worked out. The witness did not regard the door as closed, but he thought any further discovery would only be within the limits already made evident.

In reply to his counsel, he said that osteopaths paid tribute to what medicine was doing and had done in the past. Osteopathy was a revolution against drug-giving as a universal therapy, but otherwise it was not out to attack the medical profession.

A Week's Case-book

As a sample of his practice, Dr. Macdonald produced a list of cases which he and his assistant had treated in a recent week. They numbered fifty-nine—thirty females and twenty-nine males—which, he said, went to refute the statement that osteopaths' patients were mostly hysterical women—their ages ranging from 6 years to 91, and the complaints for which they sought treatment were as follows:

Curvature of spine	7	Digestive troubles	4
Lumbago	7	Flat-foot	3
Rheumatoid arthritis ...	6	Mental cases	3
Sciatica	5	Deafness	2
Brachial neuritis	5	Asthma	1
Heart disease	4	Diabetes	1
Accidents	3	Epilepsy	1
Migraine	4	Influenza	3

He treated all these as an osteopath. Since his return from Kirksville, U.S.A., he had never treated a patient medically, except during the war years, when he did surgery. He had never written a prescription, but he had given morphine for relief of pain, and had used drugs such as hyoscine or omnopon when treating a drug addict; also in treating asthma, if the patient had been accustomed to one particular drug, he had on occasion switched him off to a less harmful one, such as ephedrine, and then stopped them altogether. Personally he never used insulin, but he admitted that it was the best treatment for a marked case of diabetes with a very big blood sugar count. Insulin was bound to lead to disuse and atrophy of the cells of the islets of Langerhans. As long as the patient stayed on insulin, the pancreas was "told not to bother about his sugar, the insulin would attend to it."

The youngest patient in the series just given, a child of 6, had epilepsy, and had been on bromide and luminal since 2 years of age. He stopped this "dope" to see what fits she would throw, and later he was able to stop the fits by treating the atlas and axis and the second and third dorsal vertebrae. He found structural abnormalities in that position. The atlas was rotated back on the left side and slipped forward a little; the axis was rotated back on the right side, forming a definite palpable thickened lump. The second dorsal had its spinous process away from the middle line, slightly over to the left side. The third had its spinous process definitely over to the right of the middle line, and there was no movement possible between the second and third dorsal, and only restricted movement between the first and second and the third and fourth. The child had improved greatly on osteopathic treatment.

He had a collection of over 300 cases, in the form of short reports, substantiated by letters from patients, to submit to the committee. In reply to further questions, he said that he did not like the expression "manipulative surgeon." The term "bone-setter" he would keep for unregistered persons who had a flair for manipulating bones and working down adhesions. The term "surgeon" was a dignified one, and should be limited to medically registered persons. There was nothing in manipulative surgery or bone-setting which was not included in osteopathy. He thought Sir Herbert Barker a marvellous bone-setter; he had himself sent him patients.

The British Osteopathic Association

Asked about the British Osteopathic Association, Dr. Macdonald said that it was formed in 1910 to protect the public against impostors, and to encourage and protect the general practice of osteopathy. It had an ethical committee, and a very high standard of professional behaviour was insisted upon. Its membership of seventy-one included five, or perhaps six, persons who were on the *Medical Register*. Among them were two others of his own name—Dr. George A. Macdonald, his brother, and Dr. Norman Macdonald, a cousin, both practising in London. Asked whether he had ever been called before any disciplinary committee of the medical profession, Dr. Macdonald said that he had not; he had often pictured himself erased from the *Register*, but comforted himself with the reflection that the General Medical Council could not take away his Edinburgh University degrees. But while he had freedom within the profession to follow any line of

treatment he liked, this did not mean that he had no difficulties with his medical colleagues. He had experienced difficulty in obtaining the help of medical consultants, pathologists, and radiologists. He related a case in which, because he was an osteopath, although on the *Medical Register*, a bacteriologist had refused to prepare an autogenous vaccine for him.

Concerning other activities of the British Osteopathic Association, he said that it had run since 1927 a very successful clinic for the poor, with a full-time osteopath in attendance; 5,000 patients had been treated. One object of the association was to establish in London a college where students could train from beginning to end, and where medical students and practitioners could get training in osteopathy. At present, however, they had nothing to offer students except a diploma of an unrecognized college. He went on to maintain that a medical man taking up osteopathy would remain the "veriest baby" in the subject if he had less than eighteen months' or two years' training. Osteopathic treatment was an art, ever being improved by those who practised the profession. He would be sorry to see medical men going for a six-months course and getting a smattering of manipulation, learning perhaps that to work on the atlas was a very good thing to stop hiccup, or to work on the sacro-iliac was good for sciatica, or to put one's knees into the patient's back and pull up the patient's arms was effective for stopping an asthmatic seizure. Those were just procedures, not capable of being used effectively and properly unless the learner was grounded in the fundamental principles behind these methods.

The Unqualified Osteopath

The witness next spoke of the mischief of unqualified osteopaths. Within 400 yards of his own consulting room there were five or six people who held themselves out as osteopaths, and none of them would be able to persuade a Board to put them on a register. He had seen cases which it would be positively dangerous for the unqualified manipulator to handle at all—cases of tuberculous or malignant disease of the spine or aneurysm of the aorta, where injudicious manipulation in general, and forcible thrusts in particular, might lead to very serious mischief. With regard to these dangerous conditions there was nothing in a medical school which was not thoroughly taught in an osteopathic school.

The witness was proceeding to discuss the differences between medical and osteopathic schools, and remarked, "We do not wish to use therapeutic agents," when Lord Dawson interposed:

But when you are using morphia or opium for pain you are using a therapeutic agent?—Yes, but not as a therapeutic agent for bringing about——

We need not go into the reason why. You are using a drug?—I am not using morphia as a therapeutic agent when I replace some other drug by it.

You said you used opium and morphia for pain. Therefore you are not at "complete variance" with the medical schools?—I will take out the word "complete," but I do submit that our view on causation of disease and the principles which guide our treatment and the form of our treatment are all at variance with the present medical schools. As a general statement, I have no use for drugs in the treatment of the sick.

It was put to the witness that osteopaths in America did use medicines, and that while Dr. Still taught that drugs were wrong he also taught how students could recognize a morphia patient. Dr. Macdonald replied that the drugs in prominent use in those days were morphia and strychnine, and what little drug therapy was necessary for that purpose was allowed to that extent and taught for that. He added: "We [osteopaths] are willing to hand over any case that requires drug treatment to drug physicians, but we must be trained to know what drugs should be given in these cases, though we do not want to give drugs ourselves." He considered it desirable that osteopathic students should know something about subjects like drugs which were not strictly the armour of the osteopath.

At the close of his examination Dr. Macdonald said that he had with him some *x*-ray photographs (presumably purporting to show the osteopathic lesion which had been so much under discussion) which he could produce if desired.

Sir William Jowitt's Cross-examination

Sir William Jowitt, for the British Medical Association, first asked a number of questions regarding the proposed curriculum, and continued:

There is no place in this country where you could get a training which would satisfy you?—That is so.

So far as the British Osteopathic Association is concerned its members are people who have qualified in American colleges?—Yes.

There is no English college whose diplomas you would consider in any sort of way satisfactory?—No, there is no college in this country whose education comes up to the level required. The British School of Osteopathy has been conducted by Dr. Littlejohn, and we all admire his individual effort, but it has not yet been enabled to bring its educational standards up to the level we would like. Dr. Littlejohn has never applied to the B.O.A. for recognition of his school.

You have stated that osteopathic treatment in the hands of an unskilled person may do grievous harm, which one of the objects of this Bill is to prevent?—Yes.

Counsel here referred to an article in the *British Osteopathic Review* (February, 1935), by W. Cooper, D.O., president of the British Osteopathic Association, entitled "Where Stands Osteopathy?" in which he asked: "Are we to have a repetition of the Pharmacists Bill and the Dentists Bill? In each case thousands of the unqualified were accepted on the new register."

It is right to say that your association has made it quite plain that if it had its way with regard to legislation it would prevent any unqualified people coming on to the register at all?—No; there is a clause in the Bill which allows a person who has practised osteopathy for three years to come on.

But so far as your association is concerned you agree that if you had your way you would have no unqualified people on the register?—Yes.

Because you realize that an unqualified man may do great harm. The field which the osteopath covers is much wider than that of the dentist, and the possibilities of disaster in the hands of the untrained man are so much greater?—Yes.

An untrained man, though on the register, might come up against conditions which he had not seen during his three years of practice?—Yes.

Yet you will have all the people who have practised osteopathy for three years without any qualification at all put cheek by jowl with the qualified people—and you assume it takes five years to become qualified—so that instead of protecting the public you are doing the reverse?—We put them all together as an unfortunately necessary step in the cleaning-up process.

Do you contemplate that these *de facto* practitioners will have to pass an examination?—I do not think so. The board which is to be set up will consider each individual applicant.

Mr. Thorpe, K.C., here pointed to the phrase in the Bill: ". . . in the opinion of the board is a fit and proper person to be registered." The intention was that the board should have complete discretion. The analogous provision of the Dentists Act, 1921, required that the Dental Board had to be satisfied as to three facts: that the applicant was of good personal character; that he had been engaged in dentistry as his principal means of livelihood for five of the seven preceding years; and that he was at least 23 years of age. Lord Elibank also drew attention to Section 17 of the Medical Act 1858.*

Sir W. Jowitt: If the object of this Bill is to protect the public it seems to me that unless you are going to have some searching sort of examination the immediate effect will be just the reverse.—I do not see that. These people are doing their work anyhow, whether on our register or not. If not on our register they are still carrying on their nefarious deeds.

Don't say "nefarious deeds"; they are doing the best they can. You are not overlooking the importance of a State register?—I withdraw "nefarious deeds." No, I know a State register carries weight.

When the State registers people it gives them a certain *cachet*. You would not suggest that it would be right for the State to form a register for any healing cult?—No, I think the State should be guided or driven by public opinion.

There are many healing cults which it would be inappropriate for the State to register?—I think so.

* Section 17 of the Medical Act, 1858, provided that any person actually practising medicine in England before August 1st, *1815*, should, on payment of a fee, be entitled to be registered. The section was repealed by the Statute Laws Regulation Act, 1875.

And the only justification of the State register is that that particular healing school has scientifically justified itself in public esteem?—Yes, we think we have.

Your justification for demanding a State register is that scientifically you have proved that there is a great deal to be said for your point of view?—Yes.

Unless you can make that good you are premature in asking for a Bill?—Yes, I agree it would be premature.

Would you agree as a test of that the opinion of unprejudiced scientific men or would you say you could make good your claim merely by the *vox populi*?—I think we have the *vox populi* already, and I do not think it would be very easy to get a scientific body of men who would be unprejudiced.

Popular opinion on scientific matters is worth singularly little?—Yes.

Scientific Authorities Oppose Osteopathy

Sir William Jowitt said there had been handed to him a statement in opposition to the Bill signed by eight hundred professors of biological and medical science of the universities of England, Scotland, and Wales, about thirty of whom were members of the Royal Society. Many of the signatories had no medical qualification or degree, and had had no medical training whatever. He handed a copy of the statement to the witness. Mr. Thorpe objected to the witness being cross-examined on the statement; it was not before the committee, and neither he nor the witness had seen it. Were the signatories going to be called to prove the facts stated? Sir William Jowitt said that five of them would be called, and their lordships would have the statement before them in due course. If an appeal was to be made to the scientific mind he thought it was legitimate for their lordships to know what was the trend of scientific opinion. He asked the witness whether it was not a fact that the vast majority of scientific opinion in this country, not merely that of medical men, was against the Bill. The witness agreed, but said that scientific men had not taken any trouble to investigate the claims of osteopaths. Lord Elibank said he did not think the statement could be put in without the signatories to it appearing before the committee. Sir William Jowitt said he did not think the committee would want eight hundred witnesses to be called. He thought it would be unfair not to put the statement to Dr. Macdonald, but he was quite prepared to pass from it if their lordships did not think it was necessary for him to put it. He asked the witness if it was not a fact that osteopathy had no supporters at all among scientists on the Continent. The witness agreed, but said that the subject had never been considered or investigated by them. Doctors in the past had been very loath to accept new ideas. He did not blame them for wanting proof of the value of those ideas before they accepted them, but he submitted that osteopaths were not claiming registration on the ground that they had proved to the scientific world that their contentions were true; they were claiming it for the protection of the public. He thought they had never had an opportunity of putting forward the scientific aspect of osteopathy, and there was a great deal of scientific evidence which had never been put before the authorities; therefore it was grossly unfair to criticize osteopathy from the scientific point of view. He did not agree that the scientific claims of osteopathy should be made good before osteopaths were recognized. Osteopathic treatment was a public need, and it was up to the State to say whether it was good or bad; if it was good, it should be regulated.

The witness agreed with Sir William Jowitt that osteopaths claimed to be recognized by the State as competent to treat all disease, although generally speaking osteopaths in this country did not treat acute cases at the present time.

Sir William Jowitt pointed out that the two main limitations in the Bill were that osteopaths were not to have the power to sign death certificates, and were not to be allowed to do major surgery. The witness said he thought that if osteopaths had had five years' training in osteopathy they should be allowed to sign death certificates. He agreed that osteopaths who were to be qualified under the new regime would learn major surgery just as medical students did, and that the field of their education should not be limited because the field of their activity was going to be limited. Osteopaths were not setting up a rival school of healing; they were only trying to meet the requirements of the moment. They could not suddenly evolve a perfect system of education, but there was a crying need in this country for a college which would train persons to become osteopaths and enable medical students and graduates to obtain training in osteopathy. Asked by Sir William Jowitt what subjects in the medical curriculum he would omit in the training of osteopaths, the witness mentioned materia medica, practical materia medica, pharmacology, and therapeutics. He also thought that a shorter course in bacteriology than was taken by the medical student should be given in the training of osteopaths, because osteopaths paid less attention to bacteria as a primary cause of disease; they dealt with the soil rather than with the seed. Also, the practice of osteopathy should be substituted for the practice of medicine. With regard to special clinical subjects, such as diseases of the skin, of the nose and throat, and of the ear, they should not be omitted from the curriculum, but should be taught from the osteopathic viewpoint.

Andrew Still's Philosophy

Sir William Jowitt asked the witness if he thought the following extract from the *British Osteopathic Journal* was a fair statement of Dr. Andrew Still's philosophy:

"What then is the great fundamental difference between Still's philosophy and that of orthodox medicine, if indeed orthodox medicine can be said to have a definite philosophy at all? It is, I think, that Still regarded men, whether as individuals or as a race, as having within themselves the forces making for their own physical wellbeing. Disease, in his view, was not due to something which attacks us from outside and over which we have no control; it was due rather to a failure on our part to live in accordance with natural laws and to keep our bodies structurally, chemically and functionally perfect."

The witness said he thought the statement could be taken as expressing Dr. Still's philosophy. Asked if he personally agreed with it, the witness replied that he would qualify it to this extent, that he thought it was absurd to make no admission of disease attacking people from without. He considered that the basic principle of osteopathy was that the body contained within itself the power needed to heal the body of its ills. Lord Dawson pointed out that that would be the principle of the therapeutic side and not the causation side. The witness agreed with Sir William Jowitt's suggestion that in the vast majority of cases the ordinary doctor would agree that his function was to assist Nature, and that in many diseases all he could do was to leave Nature to effect a cure. Turning to diseases for which there are specific treatments, Sir William asked the witness if he, as a medical man, would give anti-diphtheritic serum in cases of diphtheria. The witness replied that he would, but that he would also treat the patient osteopathically; the body naturally produced the serum, but he would add to it, because by the injection of anti-diphtheritic serum the mortality rate had been reduced from 30 per cent. to 4 per cent.

Lord Dawson: Therefore on this particular occasion the body does not provide an adequate amount of the power needed to heal the body of its ills? The Witness: In that particular instance the body has not produced the adequate amount of antibodies to deal with the invasion successfully.

The witness agreed with Sir William Jowitt that in the diagnosis of disease there was no difference, so far as the condition was concerned, between doctors and osteopaths; but osteopaths, he said, also considered the physical framework abnormalities. He did not consider that before a disease could be treated with any competence it must be diagnosed. In a large number of cases of sick people it was impossible to make a diagnosis, especially a textbook diagnosis, and he thought the progress of medicine had been very much retarded by the over-emphasis of the importance of diagnosis. It was often not in the best interests of the patient to wait for an exact diagnosis. He was of the same opinion as Lord Marley, who had said that there was a disharmony in the body which preceded the actual recognizable effects or diseases, and it was for evidences of that disharmony that osteopaths looked. He agreed that in cases of acute diseases diagnosis was of the first importance, and that the methods of diagnosis employed by doctors and by osteopaths were the same in such cases.

The Causation of Disease

Turning to the cause of disease, Sir William Jowitt asked the witness if he agreed that typhoid fever was caused by *B. typhosus*. The witness replied in the affirmative, but added that osteopaths believed that if the bacillus obtained entrance into a healthy bowel there was not so much chance of disease as when it entered a bowel in an unhealthy state.

Sir William Jowitt: Have you any evidence at all to prove that persons who escape the ravages of the bacillus are those who are osteopathically sound and that the people who fall victims to it are osteopathically unsound?—No, we have no evidence whatever; it is merely our idea. We believe firmly that it is so.

Have you any evidence that those people who get malaria are those who are osteopathically unsound?—No, we have no evidence.

You believe that the question as to whether you are osteopathically sound or not has no bearing whatever on the question of malaria?—No, not on the question of malaria.

Have you any evidence to show that the children who get measles are those who are osteopathically unsound and that those who do not have measles are those who are osteopathically sound?—No, we have no evidence at all.

The witness contended that such evidence could not be obtained. It would mean taking, say, a thousand children and making them osteopathically sound, then subjecting them to the infection of measles and ascertaining how many of them contracted measles as compared with a thousand average children.

Sir William Jowitt: You must have treated in the hospitals of America hundreds of cases of tonsillitis. Have you no statistics to show the proportion of those people who were osteopathically unsound?—We never have found a patient who was osteopathically sound.

Asked as to the difference between medical men and osteopaths with regard to the cause of disease, the witness said that medical men looked upon disease as a thing which was conferred upon men by some extraneous agent, chemical or bacterial or physical. Osteopaths held that many germ diseases, such as measles, influenza, pneumonia, and tonsillitis, would not occur if the body were kept in a perfect osteopathic order.

Sir William Jowitt: What evidence have you to show that those who are osteopathically sound will not get pneumonia? I have no evidence that you would accept.

Anything that would appear to you as evidence would appeal to me, I think. Have you no evidence of any sort or kind?—We have only our individual clinical experiences, which have been collected together in certain hospitals in the United States. We in this country have no evidence.

It seems to me astounding that scientific men should make this statement without any evidence at all of it.—The justification I have for my opinion is my own personal experience.

How far does your own personal experience enable you to tell their lordships that you have found that the cases of pneumonia you have treated have been confined to people who were osteopathically unsound?—I would not put it as strongly as that.

You have found in the course of your experience pneumonia in people who were osteopathically sound?—No, I do not believe an osteopathically sound person could have pneumonia.

Are there many osteopathically sound people?—No.

Asked by Sir William Jowitt whether he really suggested that the question of whether a person was or was not osteopathically unsound had anything to do with the causation of disease, the witness said he had evidence that osteopathic abnormalities produced disease—for instance, asthma. His evidence was that in all cases of asthma osteopathic lesions were found, and when they were removed the asthma disappeared. The witness admitted that that was not a universal rule, but he asserted that the proportion of successes in dealing with asthma was larger in the cases treated by osteopaths than it was in the cases treated by doctors.

Sir William Jowitt: Have you any evidence of that?—No.

Why do you think it is larger?—Because we succeed where they fail. We only get their failures.

Do you mean by that that the doctors send their cases to you?—Yes, now they do. Osteopaths have successfully treated the failures of the medical profession.

Sir William Jowitt suggested that all doctors would agree that in certain cases manipulative treatment undertaken by a man who was competent to perform it might be very useful. The witness agreed, adding that it was the three words "in certain cases" to which osteopaths objected.

The Cure of Disease

Turning to the question of the cure of disease, Sir William Jowitt asked the witness if he had very strong views about drugs, and the witness replied that he had. He agreed that the controversy about indiscriminate drugging had raged for many years. Sir William referred to an essay written by Oliver Wendell Holmes in 1842, when he was a professor of anatomy, in which he said: "I firmly believe that if the whole materia medica as now used could be sunk to the bottom of the sea it would be all the better for mankind and all the worse for the fishes," and went on to castigate the English school of medicine as opposed to the French, because the English school, he said, went in for the indiscriminate use of drugs. In answer to Sir William, the witness agreed that the revolt against drug therapy was in existence before the time of Dr. Still.

And there is no doubt that amongst the doctors in London to-day, and not only in London but on the Continent, the battle against indiscriminate drugging has been fought and won?—Yes, but no other body of men except the osteopaths, in their iconoclastic approach to drug-giving, has supplied any alternative method.

There is no doubt that the medical school of thought in this country and abroad has for years set its face against indiscriminate drugging?—Yes, but I contend that that is very largely thanks to the osteopaths. We have won that stage of the battle. Now we should like medical men to adopt our viewpoint in disease and approach our methods more closely.

The witness agreed that it would be ridiculous to say, "Because I am not going to use drugs indiscriminately, therefore I am not going to use drugs at all." He had never heard Still say that in no circumstances must drugs be used, but he had never heard him make a definite statement that drugs should be used, and, so far as he knew, Still had never administered a drug.

Sir William Jowitt suggested that no scientifically trained man could possibly eliminate the use of drugs to-day, but osteopaths wanted to have the best of both worlds—to adhere to Still's theory and to use drugs. The witness replied that osteopaths did not want to use drugs. They admitted that certain diseases could be cured only by drugs, and they handed over to the medical profession patients who suffered from these diseases. Sir William pointed out that osteopaths were asking in the Bill for permission to treat those very patients; the witness replied that they did not wish to treat them with drugs; they wished to teach their students the amount of materia medica that was necessary to enable them to recognize what illnesses should be treated by drugs, and they would then hand them over to the medical profession.

Sir William Jowitt: You realize that in this Bill osteopaths are asking to be recognized as being fit to treat all diseases?—Yes.

And you recognize that there are a lot of diseases with which your treatment cannot cope?—I recognize that there are a few diseases which we cannot treat so successfully as they can be treated by medical methods.

Sir William Jowitt had not concluded his cross-examination when the committee adjourned.

FIFTH SITTING

The Select Committee met again on Monday, March 18th, when the cross-examination of Dr. W. Kelman Macdonald by Sir William Jowitt, appearing for the British Medical Association, was continued. In reply to a general question, the witness stated that medical progress had been retarded by an ignoring of the laws of physical science in investigating disease. Osteopathy was a step forward, in keeping with the spirit of the age. The next step, which was not far away, would be on the lines of electronic medicine.

Manipulative Surgery

Dr. Macdonald admitted that he was the author of a letter signed "Qualified Osteopath" in the *British Osteopathic Review*, in which the following passage occurred:

"The work recently done by Dr. James Mennell . . . has been welcomed heartily by the medical profession. It is entirely osteopathic in its nature and reads like an osteopathic textbook, and he is now doing what the osteopaths have been doing for two generations. In short, the medical profession has been forced to interest itself in manipulative surgery by the success of manipulators outside its ranks. That is common knowledge. The other branch of osteopathy, manipulative medicine, has not yet been discovered by the medical profession."

Sir W. Jowitt: The medical profession to-day is fully alive to the benefits of manipulative surgery in proper cases?—Yes, and I think that has largely been brought about by the work of Hutton and Barker and other bone-setters outside medical ranks.

What of the famous surgeon Sir Robert Jones?—He, too, came from a bone-setter's stock. His uncle was the son of a blacksmith, Thomas, of Thomas's splint fame.

Jones was a very great manipulative surgeon?—The greatest orthopaedic surgeon that ever lived.

But you agree that the medical profession is fully alive to the value of manipulative surgery?—I do not say sufficiently alive. *Backache*, by J. B. Mennell, is an osteopathic textbook inspired by our teaching.

Do you do ear surgery with the finger?—I did practise it, but gave it up because it is a very highly evolved technique, and in my opinion requires a man to do it as a specialty. In catarrhal deafness the results of finger surgery are astoundingly good.

Manipulative medicine, you say, has not been practised in this country at all?—Except by osteopaths.

But all the osteopath is doing is "office business"?—Yes, the majority.

And therefore he cannot deal with acute diseases, for none of the osteopaths attend hospitals?—Manipulative medicine is being practised every day by the osteopaths. It is not acute disease work only.

So far as acute diseases are concerned, manipulative medicine is not practised in this country?—We have not the opportunity.

The witness here stated that because he was an osteopath, although he held a medical degree, he was not allowed to follow his patients into certain hospitals in Edinburgh. He would not mention the names of the hospitals, but offered to write them down. Lord Elibank mentioned that a proposal to employ a qualified osteopath at one of the hospitals in Edinburgh had been turned down by a majority of the governors.

Pernicious Anaemia

Sir William Jowitt next asked what was the osteopathic treatment of pernicious anaemia. Witness said that the treatment was to look for any osteopathic trouble, remove it by manipulation, and work on the nerve centres in the spinal column which had been proved by experiment in the laboratory to have an influence on the blood cells.

In reply to Lord Dawson, Dr. Macdonald agreed that much valuable work had been done by Minot and others on pernicious anaemia during the last five years. When a patient came to him with pernicious anaemia he advised liver treatment because it had been proved to produce definitely good results, but he contended that liver treatment in this condition was not drug therapy as osteopaths understood it, for osteopaths appreciated the value of endocrine products and utilized them where indicated; but they also maintained—and he thought could scientifically prove—that osteopathic treatment influenced the liver so that under manipulation it produced a greater amount of bile than normally, and, by implication, produced a greater amount of the secretions necessary for combating pernicious anaemia. He "took his hat off" to the work done with liver by the medical profession.

Lord Marley said that as it appeared to him there were two possible methods of applying liver treatment, one by the stimulation of the active principle in the patient himself, and the other by the administration of liver to make up the deficiency. Was there any reason why gradually diminishing doses of liver extract should not proceed along with a gradually increasing development of the active principle in the patient himself?—Witness: "That is, in fact, what we do."

Lord Dawson here gave for the benefit of the committee a brief exposition of the function of the liver and its secretions and of the ductless glands in general. He pointed out that it was not the bile but the ductless secretion of the liver which represented the anti-anaemic principle. Dr. Macdonald said that he would not regard any internal secretion as a drug in the osteopathic sense, nor any preparation, such as parathormone in thyroid cases, used for the purpose of making up a glandular deficiency. Even when such substances were made artificially in a laboratory with a chemical formula, they did not, in his view, come within the osteopathic definition of drugs.

Asked whether he could show the committee any evidence that persons with pernicious anaemia who had the benefit of manipulation plus liver recovered better than those who had liver alone, Dr. Macdonald said that he had no direct evidence, but evidence went to show that manipulations increased bile, and although that was not an internal secretion of the liver, it was likely that if bile were stimulated the internal secretions were stimulated also. In reply to the suggestion that the time had come when that theory should be put to the test, he said that osteopaths had not the hospitals nor the money. He had not chosen this ground of pernicious anaemia, which was one of the osteopaths' reputed failures, though they were dealing with it not unsuccessfully.

Diabetes, Tuberculosis, Cancer

Sir W. Jowitt passed to the condition of diabetes, Dr. Macdonald declaring that by manipulation of the spinal column the supply of insulin could be increased, his evidence being contained in Bulletin No. 2 of the A. T. Still Research Institute. This was one of the seven bulletins which he had said on a previous occasion to be "not very good," but it contained an account of one experiment worth consideration—namely, an experiment carried out on thirty-three dogs in which, when artificial osteopathic lesions were produced, glycosuria, from a trace up to 5 per cent., occurred.

With regard to tuberculosis, he had no statistics to show that manipulative treatment had been beneficial. He thought that the treatment of tuberculosis by the medical profession and by the osteopaths was practically the same. They both got results by following natural methods. He mentioned one case of pulmonary tuberculosis which had been repeatedly found positive, and after osteopathic treatment a negative report was forthcoming. In cancer he thought the position was pretty much what it was when he was a student. He never treated cancer cases by manipulation. He thought it almost criminal not to have a surgical operation in an operable case.

The Future Qualification of the Osteopath

It was next put to the witness that if the Bill became law the question would immediately arise as to how the osteopathic students would get their training.

Do you contemplate that these osteopaths of the future will go to the medical schools?—We contemplate that as an undesirable necessity—undesirable, I mean, because, naturally, we would rather have complete facilities for training our students ourselves. In the meantime we are willing or anxious that our students should, for the first two years, go to a medical school to study anatomy and physiology, and probably also pathology.

Why should they not qualify as doctors and then become osteopaths in a post-graduate course?—For the simple reason that it is unfair to ask a man who wants to practise osteopathy to spend seven or eight years in becoming a legalized osteopath.

Osteopaths make a good living?—I agree that they are more successful than the average general practitioner, often more successful than many medical consultants.

Dr. Macdonald was then questioned about his experience at Kirksville, where Still had taught osteopathic principles and technique. He said that "he went to America as Saul of Tarsus and came back as Paul." He agreed that it seemed rather incongruous that within one year of his arrival he should have become professor of the principles of osteopathy at Kirksville, yet it was not so, for he was able to pull out of

medicine only the basic facts which were applicable to the principles of osteopathy.

Sir W. Jowitt suggested that if Dr. Macdonald, after a year's training, could become professor of the principles of osteopathy at the most important osteopathic college in the world, it would be a good thing for the student to go through the accepted schools of medicine—the education at which, Dr. Macdonald had admitted, was first-rate—so that he might use his own knowledge as an instructed person as to what methods to adopt and what to discard. Dr. Macdonald still maintained the practical objection of the unreasonable length of study entitled. If this Bill were not passed he agreed that some might do as he himself had done, but larger numbers would go to the osteopathic college only. Asked whether it would not be possible to start an osteopathic hospital in a large city, Dr. Macdonald replied, "Never without this Bill."

Sir W. Jowitt: You are asking the committee to pass this Bill on the strength of the claims which osteopathic medicine has made in America?

Dr. Macdonald: No, largely in America, but we have twenty-five years' experience of osteopathy here.

Lord Elibank: I did not introduce this Bill on what had been claimed by osteopaths in America. I introduced it on what I believe to have been achieved in this country. Therefore I cannot associate myself with the reply of the witness.

Dr. Macdonald: I did not fully appreciate the question. I think that what the osteopaths have done in this country justifies this Bill.

A little later the following passage occurred:

Sir W. Jowitt: You are frightened lest the medical profession should take osteopathic principles and popularize them for themselves, forgetting entirely that those principles are completely osteopathic by right of discovery and priority of use for fifty years?—We are not frightened about it. There is a great risk of this happening, that the medical profession will pick out of osteopathy what they consider to be useful, but will not adopt our principles.

My suggestion to you, Dr. Macdonald, is that that is exactly what you have been doing, that you have, wisely and properly, put on one side the guiding principle which Dr. Still elaborated (drugless medicine), for the simple reason that no intelligent man to-day can possibly accept it?—I have most definitely not done so. I found that medicine contained no basic guiding principle. I went to America and saw that osteopathy had a guiding principle and a practical method of putting it—a principle the medical profession dare not deny—into operation for the benefit of humanity.

Do you still adhere to Still's principle?—I do.

Was Still's principle this, "He who so far forgets God's teaching as to use drugs forfeits the respect of this school and its teaching"?—Dr. Still said so.

That was his principle?—No; he saw that some osteopaths were beginning to be taken with the glamour of medicine, and found it easier to give morphia than to investigate the body.

You accept the principle that the body contains within itself all the substances necessary for the cure of disease?—Yes, we do.

Then you are paying lip service to the principle and in practice departing from it?—I strongly protest.

How do you reconcile the two?—In the healing art there can be nothing absolute. It is not a question of science. Neither medicine nor osteopathy is a science, and I protest most strongly against it being said that my sincere effort along these lines has anything to do with lip service.

Sir W. Jowitt's cross-examination of this witness had occupied more than four hours.

Osteopathic Training

Dr. Macdonald was next examined by Mr. Cyril Radcliffe, K.C., for the Royal College of Physicians and the Royal College of Surgeons. In answer to a preliminary question, he said that there were three osteopaths in Paris; he thought that was practically all on the Continent. The language difficulty was one reason for its failure to spread. It was an importation from English-speaking countries. He did not agree that in going to Kirksville his medical training was an immense advantage. He carried nothing of his previous medical training so far as treatment was concerned which was of the slightest benefit to him. So far from enabling him to outstrip other people at Kirksville, he had to rid himself of a good deal of "wrong stuff." The great advantage he had was that he was in the house of Dr. Still, and, learning from the fountain head, he was perhaps able to be a worthier disciple than the student taking ordinary tuition. Lord Esher said that it was rather difficult for the witness to put it forward that it was his superior ability which helped him at Kirksville.

The question arose whether it would be possible for students intending to be osteopaths to take part of the course at the medical schools. Mr. Thorpe, K.C., said that even now many students of the British School of Osteopathy took their preliminary courses in London University.

Predisposition to Diphtheria

The witness was asked as to a statement made in *Practice of Osteopathy*, by McConnell and Teall, that "by osteopathic treatment many cases of typhoid fever may be aborted, if treated correctly, within the first week." Lord Dawson pointed out that in a very large number of cases it was not possible to say that it was a typhoid infection until the first week was over. Another passage from the same work read:

"The exciting cause of diphtheria is the Klebs-Loeffler bacillus. The predisposing cause is obstruction to the circulation of the pharynx and tonsils by subdislocations of upper cervical vertebrae, and even the lower cervical and upper dorsal, and severely contracted deep muscles of the neck."

The witness said that if an experiment were possible it would be shown in an outbreak of diphtheria that persons who had "bad necks" osteopathically speaking would take diphtheria in a larger percentage than persons who had "good necks."

Lord Dawson: You would not make that statement without objective evidence. Where are we to find it?—I have not the evidence to give you. Such is my confidence in the truth of osteopathic principles that we believe we are right about it.

In the world of medicine and science, in which I include osteopathy, we first investigate our data and then draw our conclusions. Has not some investigation taken place?—I can give no details about that, but I submit it is rather an unfair position to put to me. Did not the work of Jenner go on for thirty years before there was any scientific proof of his contentions?

I do not want to be dragged into that, though there is an effective answer. But before we scientific people make statements of great importance we should have scientific experiments.—I cannot give figures relative to diphtheria alone.

Lord Marley: In all cases of diphtheria which have come your way have you found these subdislocations of the spine existing?—Yes.

You have never come across a case of diphtheria in which this subdislocation was not present?—It was always present.

Suspicious of Drugs

The witness was asked by Mr. Radcliffe how the practitioners of osteopathy would keep themselves abreast of scientific advance. He replied, "They can read the *British Medical Journal* and the *Lancet*—a compliment you do not pay in return to us." Asked whether the osteopathic student would not be given a bias of suspicion against drug therapy, he agreed that the student would not be particularly interested in the development of that side of medicine. At the same time, because a student was taught osteopathic methods, his critical faculty would not be lost.

You are going to teach him the basic principles, which mean that, except in a few cases, drug therapy is "on the wrong tack"?—Yes.

Can a man educated in that way be expected to keep himself abreast of discoveries in drug therapy?—If there is any new discovery in drug therapy he will know about it sooner or later. The man appointed to teach pharmacology and therapeutics will be a medical man trained in materia medica, and it will be his duty to keep students abreast of the times.

And after qualification he will still be interested in the developments of drug therapy?—Certainly.

A few sharp exchanges took place between the witness and Mr. R. O. Jones, cross-examining for the Nature Cure Association, turning chiefly on the definitions of osteopathy. Mr. Jones put it to the witness that osteopathy was being made to include many therapies which were not properly

osteopathy at all—surgery, hydrotherapy, dietetic treatment, and so forth. He asked whether digital examination of the Eustachian tube could properly be called osteopathy. Dr. Macdonald retorted that it was a beautiful example of it. Mr. Jones put it that the effect of the Bill would be to detach osteopaths from the Nature Cure Movement to which they properly belonged. The witness replied that there was nothing in the Bill which interfered with the activities of nature cure practitioners.

Does it not interfere with them practising osteopathy?—It only says they must not hold themselves out to be fully trained osteopaths.

The standard will be osteopathy, plus surgery, plus hydrotherapy, plus a number of things?—There will be no "pluses." The osteopathic school is just big enough for itself and no more.

Hospital Statistics from California

In re-examination by Mr. Thorpe, Dr. Macdonald brought forward some figures from the Los Angeles county general hospital—a hospital divided into two units, a medical and an osteopathic, which had been carried on side by side for four and a half years. The osteopathic unit had an attending staff of forty-five, a consulting staff of three, and a resident staff of thirty-two. The normal osteopathic bed capacity was 196, which was approximately one-tenth of the capacity of the entire hospital, and arrangement was that, subject to the patient's preference, every tenth patient admitted should go to the osteopathic unit; thus the cases in the two units were comparable in range, severity, and quality. The figures, based on the official returns of the general superintendent of the whole hospital, who was a medical man, portended to show that the percentage of deaths in the medical unit in a recent year was 9.78, and in the osteopathic unit 5.52. The average number of days' residence for the hospital as a whole was sixteen, but for the osteopathic unit only 11.73.

In reply to further questions from his counsel, Dr. Macdonald said that there had been no serious attempt on the part of orthodox medical practitioners to investigate either the claims or the results which osteopaths had obtained.

Dealing with educational facilities for osteopaths, he said that the view of the British Osteopathic Association was that there ought to be an effective college of a certain standard or no college at all. Dr. Littlejohn, the principal of the British School of Osteopathy, took a different view: that it was better to have some kind of college than no college. If this Bill passed, the school authorities and the association would be in complete agreement and willing to accept the standard laid down under the Act.

An X-Ray Demonstration

Dr. Macdonald then produced some *x*-ray films, which were shown, by means of viewing-boxes, to members of the committee, and which, he said, exhibited the osteopathic lesion. They related to three cases, the first of which showed a lateral curvature of the spine secondary to a pelvic twist. It was not a case of scoliosis *per se*, as the ordinary practitioner might think, but of sacro-iliac unbalance. The patient, a girl of 15, had digestive disturbances and considerable menstrual trouble, all of which was attributable to the pelvic twist, and cleared up after rectification of the abnormality. The other two cases illustrated what Dr. Macdonald described as osteopathic lesions in the lumbar vertebrae.

In answer to Lord Redesdale, the witness said that osteopathic lesions were not "catching"; there was some evidence that they were heritable. Asked whether an ordinary doctor would contend that epilepsy could be cured by bromide or whether it was given merely to keep things quiet, the witness said that it was given to keep things quiet. Asked whether the sole reason why osteopaths did not deal with acute cases was the scarcity of osteopaths, he replied "Yes."

Mr. Dickens asked the committee to examine the document giving the Los Angeles hospital figures which Dr. Macdonald had just handed in. It was not, he said, an official document, but an extract from various reports made by the journal of some osteopathic association, and set out the facts in a partisan fashion.

The committee adjourned until Friday, March 22nd.

Reports of Societies

RADIUM TELETHERAPY

At a meeting of the Section of Radiology of the Royal Society of Medicine on March 15th, with Dr. F. HERNAMAN-JOHNSON in the chair, a description was given of the experimental work which has taken place at Westminster Hospital during the last six years on the radium bomb.

Mr. E. ROCK CARLING, after mentioning that with the exception of a bomb used by Professor Russ some years ago, it was to the surgeons that the introduction of radium teletherapy into hospital practice was owing, described a bomb as an uneconomical isolation of a small cone of the sphere of radiations from a source. When the work in England began there were at least seven bombs in use abroad. The advent of the bomb raised some special problems, notably of protection. An escape of 5 per cent. of harmful radiation from 100 milligrams of radium was not very serious, but when the escape was from four grams it was a different matter, and those who had four grams adopted heavy protection or paid the penalty. The problems before the radium teletherapist were in general those ordinarily dealt with by the deep *x*-ray therapist. Unfortunately, there was only one method available for the solution of many of these problems—namely, that of trial and error. The first problem was the construction of an apparatus which could safely be used by the workers. This was reduced ultimately to a question of discipline and distance.

Here Mr. Rock Carling showed a cinematograph film of the various models which have been tried out at Westminster Hospital, leading up to the present two-gram bomb. The first was a provisional apparatus prepared in November, 1929, for a one-gram unit. The second was a four-gram apparatus, the tubes being disposed in four groups of five tubes, each tube containing 200 milligrams, on the circumference of a circle 8.5 cm. in diameter. The third model was a second four-gram bomb in which twenty radium tubes were disposed tangentially at will on three circles. The fourth model was a mobile one-gram bomb, of cupola form, bringing about a great reduction in size, and enabling the radium to be taken to the patient instead of the patient being brought to the radium. In the fifth model the weight was reduced to 38 lb.; the bomb was suspended with a counterweight, and had a considerable pendulum, so that the patient might make small movements. It had gold screenings instead of lead to diminish the outside diameter of the cupola. It was important that the attendant should not remain in the treatment room, and yet there must be accuracy in application, and a good deal of ingenious planning had taken place to secure this result. It was hoped soon to evolve a perfectly satisfactory model, using a longer neck to the cupola, and employing a larger proportion of gold and platinum in the construction to diminish size.

The second problem was to ascertain with precision the site and extent of the tumour. This meant skilled observation and long experience and the use of radiography in all its methods of operation. The third problem was to obtain a depth-intensity and dose of cancericidal order without damage to the skin or intervening and surrounding tissues. It resolved itself into having a sufficiency of radium, using small fields, and employing skilled selection and direction. The fourth problem was to record the dose received by the tumour. The stomach, breast, and prostate were the regions assigned to the Westminster workers by the Radium Commission, but his own enthusiasm with regard to radium in tumours invading these regions was never very great, because even if they had a success they did not know what dose the tumour had received. Calculated fields might satisfy the physicist perhaps, but not the doctor in charge of the patient who failed to get well. The fifth problem was to ascertain the best total duration and spacing of component parts of the total dose. At Westminster in the course of five years they had varied their exposures from three hours, sometimes twice a day, to fifty minutes or one hour once a day. His own preference was for one, or at most two, daily exposures of one hour, with second treatments after an interval of three months, sometimes less. The solution of the next problem, that of finding means for increasing differentially the

sensitivity of malignant cells, had not so far been encouraging. As for the final problem, that of safeguarding the patient's general health, notwithstanding Regaud's opinion that none of his patients had ever suffered, the speaker was convinced that as gamma-ray therapy had extended to the thorax and upper abdomen a certain risk had to be avoided. There was biochemical evidence that liver function might be disturbed. The spleen certainly might suffer histological damage. The kidneys in sick persons might show signs of cellular disease, even if there was little evidence of functional incapacity. It was probably unwise to radiate for long the whole mass of blood passing through the heart. Nevertheless, healthy tissues had remarkable powers of recuperation, of throwing off signs of damage if periods of rest were given.

Unless there was any advantage in the use of short waves there was no permanent field for teletherapy. The combination of long and short waves appeared to offer advantages, permitting continuance of irradiation when one type ceased to be effective, safeguarding the skin, and perhaps affording a biological superiority. The immediate future called for improvements in apparatus, agreement as to the best unit applicable, further exploration of means for measuring dose received, an accumulation of observations as to effective dose in relation to tumours of different location and histological type, better grouping of clinical classes, closer co-operation with physicists, and concentration of control of both gamma and *x*-irradiation in the same hands. As against the promised million-volt *x*-ray machine radium was not entirely at a disadvantage. The initial cost was certainly great, but depreciation was negligible and upkeep quite small. *X*-ray tubes were costly, and required considerable accommodation. The greatest desideratum of all was more radium ; at Westminster they must have three grams, they ought to have four, and they would like an unlimited amount. Mr. Carling concluded with a remark on the status of the radiologist, and emphasized the importance of academic distinction if radiologists were to take their proper place in the hospital hierarchy. He was the last person to overrate the value of examinational success, but the path of distinction on a hospital staff was barred by the requirement of higher diplomas of the Royal Colleges or higher university degrees, and unless the radiologist had them he would risk being regarded as belonging to a lower grade of workers.

Dr. F. M. ALLCHIN, also of Westminster Hospital, added some further details about the work there. He also recounted the work so far done towards arriving, in respect of radium, at a dosage unit equivalent to the r unit decided upon for *x* rays six years ago. At the same time he felt strongly that workers must not be bound entirely to the physical aspect of the matter and expect that cases of a certain type could always be treated by so many r units and cases of another type by a different number: clinical considerations must have their due weight. With regard to the effects on the patient's general health, since the dispersal of the four-gram unit the effect of smaller bombs on the general condition of the patients had been in the great majority of cases quite negligible. No morbid alteration had been observed in the principal functions of the body. The treatment, although in some cases prolonged, was quite without injurious physical effects. The worst effect seemed to be a condition of mental depression, which passed off directly after treatment. With regard to skin reactions, it had always been expected to get the moist desquamation described by Regaud, but that was not forthcoming. There was very little erythema, and within four or five weeks from the end of treatment it would hardly be noticeable that the skin had ever been irradiated at all. So far as concerned the protection of workers, in the present model they relied upon speed of adjustment and rapid "get-away" from the scene of action. The actual time occupied in applying the bomb in position, and the reverse process at the end of treatment, was in each case eighty seconds. Allowing the operator two visits of twenty seconds each in the course of an hour's treatment, this meant two minutes' exposure for the operator for each patient, so that she was actually within the sphere of the radium for sixteen minutes in an eight-hour day. All accepted methods of safeguarding the health of the operators had been employed. One male operator developed eosinophilia, but this disappeared when he was put on another type of work. He believed that there was a very definite and useful field for radium teletherapy. He looked forward to the day when, with improvement in apparatus and larger quantities of radium, they could attack with some hope of success tumours of the intestinal tract and thorax. He would prefer a beam capable of variation in size so that larger areas might be treated without undue irradiation of surrounding tissues.

The remainder of the discussion, to which certain workers from the Department of Physics in the National Physical Laboratory contributed, was devoted principally to technical points in the construction of apparatus. Mr. G. E. BELL of that department mentioned that the softest gamma rays corresponded to one-million-volt *x* rays, and an equivalent to hard gamma rays would be afforded by two and a half million volts. As the spark with a million-volt apparatus jumped something like nine feet, the accommodation which would be required for apparatus of higher voltages must be very considerable. A million-volt *x*-ray tube properly protected would weigh something of the order of six tons. Dr. B. W. WINDEYER said that in this country there were only about ten radium units of more than one gram, and abroad not more than fifty altogether ; and the total amount of research work in radium teletherapy was infinitesimal compared with that put into *x*-ray therapy.

TREATMENT OF INJURIES

In the Section of Physical Medicine of the Royal Society of Medicine on March 15th, with Dr. J. B. BURT presiding, a discussion took place on the treatment of injuries. The discussion arose out of the recent report of the British Medical Association Committee on Fractures (*Supplement*, February 16th).

Mr. E. W. HEY GROVES, vice-chairman of the committee, said that the scientific principles on which the treatment of injuries was based—namely, anaesthesia, asepsis, and restitution of form and function—had undergone very little modification during the last generation. Even during the war nothing substantially new was discovered, but the results of treatment at the end of the war were immeasurably better than at the beginning, thanks to the better application of those same principles, and especially to the organization of the treatment unit. Organization was needed to secure unity of control, continuity of treatment, and accurate follow-up. He exhibited some charts comparing the period of invalidity and percentage of permanent disability under haphazard treatment and treatment in an organized clinic respectively. Mr. Hey Groves then proceeded to give, with the help of sketches, an analysis of the causes of bad results—namely, lack of supervision, errors in diagnosis followed again by lack of supervision, and errors in primary treatment followed by discontinuity in after-care. He ended by pointing out that, although certain well-defined scientific principles had been proclaimed in season and out of season, one of the principal reasons why nothing had been done was financial. The voluntary hospital was not anxious to increase its liabilities, and the junior staff naturally, and perhaps rightly, were not attracted as a rule to take up specialties in which there was no financial return. It was time to meet, by the simple business methods of insurance, the urgent need of providing an organized fracture clinic at every large hospital.

THE PLACE OF PHYSIOTHERAPY

Dr. C. B. HEALD said that the report of the B.M.A committee derived its importance not only from the great organization from which it emanated, but also because the Ministry of Health had circularized it to all local authorities, so that it would probably form the background of the future treatment of fractures and injuries throughout the country. After pointing out

how much there was in the report which deserved warm support and approval, Dr. Heald addressed himself to certain points with which physical medicine would disagree. Three main causes were given for delay due to imperfect surgical treatment—namely, failure in primary reduction, in immobilization, and in promotion of functional activity. He considered that two other factors should be added: failure to recognize the part played by soft tissues when bones had been injured, and failure to recognize factors in the general health of the patient by concentrating on the injury only. He characterized as amazing the statement of the committee that "massage and electrical stimulation have been largely misapplied in the treatment of fractures," and that "active use of the part should, wherever possible, replace massage and electrical treatment." If the committee really intended a condemnation of electrical treatment in all stages of any fracture or injury then the surgeons in charge of such fractures were to blame. No intelligent practitioner of physical medicine would use electrical stimulation in the early stages of fracture. The committee was obviously unaware of the capacity of electricity to act in a reverse sense to stimulation—namely, as a true sedative and antispasmodic. He also deprecated the lack of vision shown by the committee in making no recommendation for the scientific and careful comparative study of different methods of treatment.

Practitioners of physical medicine (Dr. Heald continued) declared that electricity, without disturbance of immobilization and without stimulation, could relieve the effusion, pain, and muscle spasm present immediately after injury. The conception of the uselessness of electricity which breathed through the whole report had been built up by the surgeons treating such injuries as a result of employing technicians whose knowledge of the physiological effects of currents on pathological conditions was obviously negligible. Perhaps the blame was not entirely at the door of the surgeons; the electrotherapist was to blame for not having presented series after series of controlled scientific statistics in support of his contention. At the Royal Free Hospital for ten or twelve years the speaker had treated the majority of the simple ambulatory fractures admitted to the casualty department from the day of their injury or thereabouts. Direct current was the current of choice in the first phase of an injury. He showed how the electrodes could be applied so as to bring about electrical endosmosis, in which fluids tended to make their way towards the negative pole—obviously desirable where there was effusion. The restoration of nerves to their normal electrical state, accompanied by disappearance of swelling, resulted in rapid relief of pain and muscular spasm, thus affording powerful aid to the maintenance of replaced bones and healthy union free from soft tissue complications. Certain fractures and injuries after this initial treatment would be ready for currents that increased the tone of the soft parts without visible stimulation—currents of regeneration and nutrition. In comparison with the tables published in the report of the committee showing average incapacity periods, Dr. Heald exhibited a table from cases treated at the Royal Free Hospital by the sedative and other electrical methods plus immobilization to which he had referred.

Site of Fracture	No. of cases	Average Disability Period	Cases Permanently Incapacitated
Colles's fracture	53	6½ weeks	1
Fracture of clavicle	20	6 ,,	0
Fracture of shafts of radius and ulna	12	10 ,,	0
Fracture of ankle (Pott's)	25	9½ ,,	0

The cases were a consecutive series of males and females, ranging from the ages of 20 to 70 years. Dr. Heald also described the scheme for the fracture clinic at the Royal Free Hospital, which incorporated some of the principles he had elaborated following his American visit in 1927.

REHABILITATION CENTRES

Dr. HAROLD MOORE, a member of the B.M.A. committee, described the work at the L.M.S. Hospital, Crewe, especially with patients from all parts of the railway who were suffering from old injuries and had already undergone long periods of disability. The majority of these cases were chronic, totally incapacitated, with no prospect of being anything else without some intensive treatment; and among the remainder the incapacity periods were very considerable, and the men had been getting no effective treatment. Lately, as a result of scrutiny, he had been able to get these cases rather earlier than at first. Taking the first 432 of these cases admitted, 323 after short periods of treatment were returned to their pre-accident work, 211 making a full recovery, and 112 remaining with some slight permanent disability, but not sufficient to prevent their return to work. The periods of incapacity of these people had averaged seven months per case, but the duration of treatment of the recovered people before return to work averaged only seventeen days. These figures brought out three points: that there was a large amount of recoverable wastage, and that a good deal of such wastage need not arise if proper treatment were afforded. A good deal of wastage which arose from a psychological factor was due to wrong treatment or lack of treatment. One important matter was the abuse of rest. Ill effects in muscles and joints were continually found in men who had been rested for weeks and had had nothing else done for them. A very important factor was medical supervision. To obtain results, such supervision must be continual and not intermittent. In his experience, apart from the necessary manipulations, it was in the simplest of exercises properly carried out that the road to recovery lay. Massage had its proper place in the rehabilitation of injuries, but this was the main form of treatment that the patients had received before coming to the centre; it had been massage and nothing else. Massage should only be used as a means to immediate activity. That it cured oedema he did not believe, and that it should be used after the initial period except as a means of activity he did not think desirable. In certain cases it was very harmful, because it concentrated the attention of the "psychological patient" on the part. There was no doubt as to the value of heat in various forms. Diathermy and other forms of electricity also had their definite value in rehabilitation work; but all these forms of passive movement should only be regarded as aids to co-operative activity. He told his patients when they came in that their cure depended almost entirely upon themselves. He had been amazed at the transformation from a partially crippled state by the simplest of exercises carried out, not for a few minutes, but for a protracted period. Activity as opposed to passive treatment was of the greatest value. Again, such treatment as had previously been given in these cases did not seem to have been sufficiently intensive in the after-stages. There was a history of attendances at a massage department once or twice a week: that was what he called playing with treatment. If the recommendations of the Fractures Committee were carried out nationally he still thought there would be room for further endeavours to reduce wastage. There was also a large volume of wastage from injuries other than fractures, and these people wanted caring for too.

MANIPULATIONS AND MASSAGE

Dr. J. B. MENNELL, a member of the committee, said that one of the things that were preached by Lucas-Championnière was that people as a whole did not regard the minor degrees of injury as being different from the more serious defects, and that if treatment for small injury were insisted upon just as if the injury were serious much time would be wasted. He never preached that splintage should not be applied, but only that it should be applied properly. Massage should only be used as a means to the restoration of function, and function came from within the individual, not from the masseur's hand. Lucas-Championnière's treatment was by mobilization and

massage, mobilization taking the primary place. No physiotherapist would agree altogether with the report of the B.M.A. Committee. One hardly liked to regard as insulting to the physiotherapist the omission of his art, but the speaker did believe that the scathing remarks in the report were justified by the abuses of physical treatment, not by the uses of it. It was for physiotherapists to continue to demonstrate that physical treatment was an essential process in the treatment of injuries. At Böhler's clinic he had seen many cases when his fingers had itched to carry out some trifling manipulation which would have restored function—function that otherwise would be long in returning if it ever came back at all. It had to be accepted that to a certain extent physical treatment "stank in the nostrils" of some of their professional brethren. It was due, he was afraid, to ignorance as to what it could do. So long as the treatment of injuries remained in the hands of surgeons, and of surgeons only, he was afraid recovery would be delayed. The physiotherapist must find his place—a place not awarded him in the committee's report—and it was one of the functions of that Section to point out to their professional brethren what could be done by these methods, and not leave them in ignorance, imagining that what they had seen in the past was all that could be accomplished. The abuse of rest was a thing against which personally he would inveigh more strongly than against anything else. Massage in its proper sphere would be as valuable as it ought to be, and that value was very great when used at the right time and in the right place. Used at the wrong time and in the wrong place it was bound to do infinitely more harm than good.

ROLE OF THE GENERAL PRACTITIONER

Mr. E. ROCK CARLING, also a member of the committee, said that the committee had not the slightest idea of "insulting" the members of that Section, or even of neglecting their excellent work. The members of the committee had attended that meeting to learn, and they had been most gently instructed by Dr. Mennell and to some extent by Dr. Heald, but he must take Dr. Heald a little to task in return. It was a pity that the committee had not Dr. Heald's figures to include in its report. The Royal Free Hospital was approached with a questionary that should have given an opportunity at least for physical medicine to shout a little louder. He thought he was right in saying of surgeons that at the end of any operation they turned, rather like a priest, to some set point of the compass, and said, "And now . . .," indicative of their sense of the humble part they themselves played in recovery from injuries and operations. Perhaps also the physiotherapist might have ringing in his ears some such adaptation of apostolic precept as, "We experts give the treatment, but the patient himself secures the increase." There was one point in Mr. Hey Groves's remarks which had aroused his interest at once. He had said that cases treated in the wards did much better than those treated as out-patients. Surely one reason was that patients in the wards were protected from the adverse influences to which out-patients were subject in the shape of trade union secretaries, touting lawyers, and anxious friends. The man was fortunate who after an injury fell into the hands of a good general practitioner and could afford to stay there. From the outset of his accident right to his return to activity his general practitioner would keep both his physical and psychological interests in good ward; he would know quite well when to call in the surgeon and when to call in the physiotherapist, and would see to it that neither exceeded his province. It would not be an exaggeration to say that surgical and therapeutic treatment accounted for perhaps 50 per cent. of the influences needed for recovery, and the other 50 per cent., as Dr. Mennell and Dr. Moore had said, were influences emanating from the patient himself. It would not surprise him in these days if a general practitioner who wanted some focus from which to radiate his good influence and suggestion should send his patient, if a peer or barrister, to an osteopath, for miracles were still wrought by faith; some others, of course, would be sent for massage; and others again would require marble halls and gorgeous commissionaires if their treatment was to do them good. He was sure that Dr. Heald would agree that, despite the value of electricity and physical measures, a very large part of the treatment should remain in the hands of the general practitioner with general care of the patient.

Dr. PHILIP HAMILL referred to an important aspect of the treatment of injuries—namely, that of nutrition and functioning of the muscles. If anything could be done to accelerate return of movement so much to the good, and it had been shown that afternoon that one active movement was worth many passive ones. In the course of some investigations he had been studying the increase in the range of movement following injection of prostigmin, and he showed a short reel of cinematograph film to illustrate from the patient's hand movements how real it was. In his view one half-crown dose of prostigmin was as good as half a guinea's worth of massage.

The CHAIRMAN spoke of the desirability of approaching insurance companies for subsidies for clinics such as Mr. Hey Groves had suggested, and also congratulated Dr. Heald on the vigorous way in which he had sustained the case for physiotherapy.

RADIUM TREATMENT OF RECTAL CANCER

In the Subsection of Proctology of the Royal Society of Medicine, on March 13th, with Sir CHARLES GORDON-WATSON in the chair, a discussion took place on radium treatment of malignant disease of the rectum and anus. A contribution to the discussion had been sent by Dr. C. Regaud of the Radium Institute, Paris; this was not read, but it was stated that it would be included in the transactions.

Sir CHARLES GORDON-WATSON had shown, before the meeting began, six cases which had received radium treatment; all of them were inoperable, and, thanks to radium, the patients were all perfectly well and doing their work after periods varying from just over seven years to just over five years after treatment. His experience covered 149 cases treated with radium since March, 1925, but whereas up to the end of 1931 he had treated 140 cases, he had dealt only with nine during the past three years; his attitude at present was to observe what happened to cases treated in the past, noting their gradual disappearance, unfortunately, from the list of survivors. He only employed radium now under certain definite limitations, namely: (1) when operation was resolutely refused or contraindicated on grounds of old age or some infirmity; (2) in selected inoperable cases when the growth was not too large and was sufficiently accessible to permit uniform radiations after colostomy had been performed and metastasis excluded; (3) the insertion of radon seeds into the retro-rectal space preliminary to excision; (4) in cases of limited perineal recurrence. There were certain disadvantages in treating small operable growths with radium. An overdose might be followed by a stricture, and a colostomy have to be done; again, failure to destroy the growth might produce fixation of the bowel at the growth site. In one operable case a brilliant success might be secured, and in another, apparently similar, a complete failure. Was it a histological or biochemical problem, one of general constitutional or of local resistance? Probably all these factors came into play. One thing was clear: the more rapid the growth, undifferentiated the histology, and younger the patient, the more sensitive was the growth to radium, but it was necessary "to get up very early" to secure a brilliant result, because in these cases early metastasis must be expected.

It was very doubtful whether radium was any better than a local resection in the operable case, where this was considered possible or advisable without colostomy. The fact was that it was not merely a carcinoma of the rectum which was being dealt with, but a rectum potentially malignant. Dukes had done much to enlighten this part of the subject, and had shown the close relationship between hyperplasia, adenoma, and carcinoma, also demonstrating the frequent presence of small adenomata

around the carcinoma, common when the carcinoma was young, but tending to disappear as the malignant growth advanced, suggesting that malignant growth was the final aim of the mucosa that had acquired a hereditary tendency to run riot. Once a rectum had given expression to a malignant tendency there was no safety for the individual short of radical excision, at the earliest possible moment, of the whole of the potentially malignant area, however small the growth.

Turning to inoperable cases, he asked why it was that the percentage of successes remained so small. Failure must often be due to some flaw in technique: increased experience, approved methods, more knowledge of the action of radium, and of the cause of radium resistance were required, though there would always be some growths so highly differentiated as to be almost as resistant as normal epithelium. Radium in rectal cancer had been given a bad name. The fiat had gone forth from Paris that adenocarcinoma was radio-resistant, with the result that most radium centres had not persevered with the use of radium in that condition. Difficulties of access and the variety of depth in different patients, not easily ascertainable beforehand, were also factors. Success would depend to a considerable extent on the amount of radium employed per cubic millimetre of growth and on filtration, while better team work, increased knowledge of the histology, the general acceptance of some standard of grading, and the establishment of a unit of gamma radiation as definite as the "r" unit of *x* rays were all necessary for future success. In adenocarcinoma heavy doses heavily filtered and of long duration—200 or more hours—gave the best results. Radium should not be used in the presence of secondary sepsis or when the growth had spread beyond the bounds of the rectum. With regard to borderline cases, when the growth was not definitely inoperable radical surgery should always be attempted in the young and middle-aged, though in the old and infirm such operations had a high mortality, and life might be prolonged after a colostomy by efficient radiation. He had an impression that interstitial radiation was liable to stimulate metastasis, sometimes in unexpected locations, and technique should be modified as far as possible to avoid penetration of the substance of the growth. He had a strong preference for radium, with its constant action, to radon, which lost its force when the fight was nearing an end, and just when a "knock-out blow" was required. He quoted some work of Dr. W. M. Levitt, on carcinoma of the rectum treated by deep *x* rays, the results not being very satisfactory, though a temporary palliation was obtained. In conclusion, he said that there need be no despair over radium treatment in cancer of the rectum, because sometimes even the most desperate cases could be controlled, and even cured, and better results might be forthcoming with more experience.

Mr. J. P. LOCKHART-MUMMERY thought it doubtful whether a rectum which had once had definite carcinoma was ever safe. In epithelioma of the anus the right treatment was radium, and not surgery, the result of excision in such cases never being very satisfactory. But that did not apply to adenocarcinoma of the rectum. He believed the question turned on technique rather than on radio-sensitivity, for the difficulty of getting at the growth for effective radiation had to be borne in mind. In very early cases of adenocarcinoma his method had been to curette the tumour right down to the fibrous tissue before putting radium in. One great trouble was the radium burn, a reaction which he had found more liable to occur in old people than in young.

Mr. STANFORD CADE held that operable carcinoma of the rectum should be submitted to radical surgery. Very early carcinoma of the anus was better treated by radium. In inoperable cases not so much attention should be paid to the possibility by radium of obviating a colostomy. It was preferable to do a colostomy before inserting radium into the growth. For radium treatment he divided cases into two groups: those relating to the pelvirectal junction and those to the ampulla. In the latter he introduced into the rectum, so that it extended above and below the lesion, a radium tube sectioned in four compartments, with 10 mg. in each, and with maximum screenage. The tube was left in position for ten days. Long radium needles were at the same time placed outside the tumour, if possible without perforating the lesion. When the growth was in the upper part of the rectum the tube method was not applicable, and there he used seeds as a second best. He had treated sixty-nine inoperable cases of carcinoma of the rectum from 1928 to 1934, and twenty-nine of the patients were still alive. Only one was alive of five treated in 1928, but eight were alive out of seventeen treated in 1929, and six of these were free from disease. It was useless as yet to talk of the results in more recent years.

Mr. JOCELYN SWAN agreed that radiation of the anus was much better than surgery. He proceeded to relate a case of very early carcinoma of the posterior wall of the rectum, which he had radiated, the patient refusing operation, in 1928; a small recurrence had appeared six and a half years later. He reserved radium treatment for cases he considered inoperable after colostomy or for operable growths in unfavourable patients. Mr. W. B. GABRIEL also urged that operable growths should be treated radically. He had an idea that in certain borderline cases which had been treated with radium, if a laparotomy had been done and a careful examination made from above, it might have been established that they were operable. A very large number of frankly inoperable cases had secondaries in the omentum or liver, and he did not see how any sort of radium treatment would help them. There were, however, a few cases which might be improved, and a very few which might be cured, by radium.

Mr. R. S. CORBETT, who had been associated with Sir Charles Gordon-Watson in some of the cases he had described, added some further details. Dr. DEARDEN SMITH of the Radium Institute, said that it was difficult for him to believe that so many failures were due to slight errors in technique. If it was simply a question of technique the immediate results, at all events, would be very much better than they were. There must be some factor discoverable either histologically or otherwise which militated against the disappearance of a rectal growth. Dr. CUTHBERT DUKES said that there was a general impression that radium had succeeded in squamous-celled carcinoma and had failed in adenocarcinoma. If that was so the question of adenocarcinoma ought to be referred back to the laboratory for further investigation as to the reasons for failure. The undoubted cases in which radium had proved effective ought to be kept in mind. It would be a terrible thing if in the disappointment occasioned by repeated failures it were forgotten that radium had cured cancer of the rectum.

Sir CHARLES GORDON-WATSON replied on the question of radium pain which had been brought forward in the discussion. His belief was that as the surgeon became more experienced he would know better what cases to treat and how to treat them without producing pain.

SURGICAL TREATMENT OF SYRINGOMYELIA

At the meeting of the Medical Society of London on March 11th, LORD HORDER presiding, the subject of the surgical treatment of syringomyelia was introduced by Professor R. E. KELLY of Liverpool.

Professor Kelly began by quoting Sir Farquhar Buzzard, who, in Osler's *Medicine* some years ago, remarked that there was no cure for syringomyelia, and stated, "Surgery cannot help us." Since then this condition had attracted the attention of the surgeon, and laminectomy, with drainage of the cavity fluid, had been done in a number of cases. He referred in particular to the noteworthy work of Poussep, who, out of five cases, had had four much improved, and he exhibited a table, compiled by French workers, giving the recorded operations, mostly by Continental, with a few American, surgeons, up to 1933. The total number was fifty. In only one case had the condition been aggravated by operation; in seven it had not been improved, in six there had been

improvement and in ten much improvement; the results in the other cases were not recorded. One worker, Juzelewski, had performed the operation fifteen times, but no indication was given of the results. Professor Kelly's own cases numbered ten, sent to him by Professor Henry Cohen, and of each of these he gave a description. He had had no outstanding successes such as Poussep had recorded, and two of the patients died from meningitis. The other eight recovered, with their wounds firmly healed, but the improvement in all had been slight; there was definite improvement in sensation, but very little effect on musculature. Surgery could not renew anterior horn cells or supply new nerve fibres. What effect the new channel might have in arresting the course of the disease he could not say, but from his experience he could not speak in the eulogistic terms of some Continental surgeons. What had impressed him was the extraordinary amount of destruction in the spinal cord compatible with perfect walking, micturition, and defaecation. All the authors agreed that the healing of the wound was slow and unsatisfactory, but that was a well-established characteristic of any wound or burn associated with syringomyelia.

[A cinematograph film illustrating the operation was then projected. The object of the operation was to relieve the tension, to lessen the possible pressure of oedema, and to establish a new artificial channel between the cavity and the cerebro-spinal circulation. The film showed an opening made in the centre of the posterior surface of the spinal cord. The edges of the dura were retracted with guy sutures. Attention was drawn to the flattening of the spinal cord and its pulsation, both flattening and pulsation indicating the presence of syringomyelia. The diagnosis was confirmed by the hypodermic syringe, in the case shown about 2 c.cm. of fluid being withdrawn. With a sharp knife the cord was divided in the middle line and the cavity exposed, and the film ended showing the cord left open and the dura being closed. A further film showed the patients at varying periods up to two or three years after operation, indicating the range of movement of the hand and arm.]

Dr. ANTHONY FEILING said that he had always understood that Horsley was the first to perform this operation, though it was not recorded in medical literature. Syringomyelia was a disease of very long duration, and many of these patients might remain in approximately the same state for years without treatment being applied at all. The operation, if it was to be adopted on any large scale, would be best tried on the small group of cases of syringomyelia which were characterized by severe pain, which in some cases was very persistent and usually localized to the same distribution. It was capable of lasting for years and was unrelieved by ordinary treatment. Wounds in syringomyelia cases healed badly.

Mr. PATERSON ROSS said that a patient had been sent to him with a view to surgery, but on *x*-ray treatment there was some improvement, so that the question of surgery was in abeyance. If there was any evidence that the cord was being compressed, or that there was a cerebro-spinal fluid block, that seemed to be a possible indication for surgical treatment. It had been stated that patients with syringomyelia took anaesthetics badly, but Professor Kelly said that he had used ether and had found not the slightest trouble.

Mr. CECIL WAKELEY said that he had performed the operation four times; in the fourth case, which was the most successful, he followed Dr. Kinnier Wilson's suggestion to swab out the cavity inside the cord with some iodine, and the result in that case was dramatic. The more the cord was attenuated by cystic swelling the better the results. He lost his third case, and when it came to post-mortem examination there was found to be another dilated cystic cavity, holding 2 c.cm., about 2½ in. lower down the cord. In the other cases so far as he had seen them the results were only partially good. It could not be said that there was a return of power, only a gain in sensation.

Mr. DICKSON WRIGHT said that his own experience of the operation was limited to two cases. In the first case the pain did disappear to a great degree after operation, but it slowly returned, and eventually there was little gain from the procedure. In the other case there was also alleviation of pain, but on recovery the patient became temporarily insane, which was explained by the cessation of the habitual painful stimulus. She had now recovered her reason and did not suffer from pain. Mr. A. J. WALTON expressed admiration for the way in which these cases had been brought forward. In such cases operation must be regarded as an experiment, but a justifiable one, and of great help to surgery. In a condition of this kind cases which appeared to be relative failures might not of necessity be so, and if the operations were continued and the records meticulously made, the procedure might yet be followed by some outstanding success. Mr. E. D. D. DAVIES discussed a case of syringobulbia and the indications for operation.

After Professor KELLY had replied to certain questions on technical points, LORD HORDER said that it was never a mistake to test out a method of treatment, medical or surgical. It was difficult to say how many surgical procedures constituted a test—Professor Kelly's ten was a very good number. There was a difference between a failure which was due to technique not yet fully established, and a failure (as apparently in this condition) in dealing with the essential pathology. The society was fortunate in being the medium for this symposium of ten cases by a surgeon who was not afraid to say that on the whole the results had been disappointing.

NUTRITION AND PUBLIC HEALTH

At a meeting of the Society of Medical Officers of Health on March 15th, with Dr. VEITCH CLARK in the chair, a discussion took place on nutrition and public health.

Professor E. P. CATHCART, in opening, pointed out that the physical state of the body was not necessarily a reliable index of good or bad nutrition. Food, in order to be effective, must be ingested by a body both physically and psychically sound. Nutrition was also much more than "well-fedness," such other factors as sleep, play, clothing, and happiness entering into the matter. Height, weight, and similar measurements were of little use in determining this intangible condition, and subjective impressions varied with different individuals or with the same individual at different times. Admittedly food played a central part, but the trouble was the multitude of experts on the subject, and the great desirability that people should not be made "food conscious." It was possible to be and remain well nourished on the simplest of dietaries, and what satisfied the palate did not of necessity supply the living cell with what it most needed. Who could say what was the optimum protein diet or the optimum intake of fat? What information was available as to the body needs of the different kinds of vitamins? There was much loose talk about the energy value of different foods expressed in calories, which were merely convenient units of measurement. The data as to quantitative alterations in diet were largely derived from observation. The reason why front-line troops in the war were given an increased ration of protein was to provide extra dynamic action and to keep the body warm. A further interesting question was as to whether too much vitamin could be given, also the actual part played by vitamins, and as to any difference which arose from taking vitamins in synthetic form. As to minerals, what was the true balance between calcium and phosphorus, and what part was played by copper in blood formation? Before the perfect diet could be proclaimed physiologists had still a long way to go. It might be thought that changes in growth would follow an improved dietary, but this was not necessarily the case, and the predominating factor in determination of stature was heredity. By giving good food it was reasonable to suppose that resistance to disease would be increased and mortality rates reduced. He deplored the ignorance on the part of the people who most needed the knowledge on the subject of the best foods to buy and the best way to cook them.

Dr. ROBERT HUTCHISON dealt with the subject from the clinical standpoint. He said it was impossible to define the subject chosen. Like "health," "nutrition" was not a static definite thing; it was something which fluctuated in everybody, and varied in the individual from day to day, and even from hour to hour. It was possible to recognize optimum nutrition and under-nutrition, but many were apt to forget the liability to over-nourishment. In a recent discussion at the Royal Society of Medicine, to which medical officers of health contributed (*Journal*, February 2nd, p. 220), it was disappointing to note the lack of agreement as to what were the physical standards by which it might be possible to determine states of nutrition, and the absence of reference to haemoglobin content as an assessable standard. It was difficult for him to imagine a quantitative malnutrition which was not attended by a haemoglobin difference. At that meeting it was said that the problem was a clinical one, that an experienced person could tell by looking at a patient whether, on the whole, he was well nourished or ill nourished. That means, however, brought in the psychological factor, a factor which, to some extent, entered into all clinical assessments. It was necessary to distinguish between primary and secondary malnutrition: the primary, which was due to some defect, in quantity or quality, of the diet; and the secondary, which arose from causes other than diet. After a long experience, especially with children, he had formed the opinion that a large part of the malnutrition found in children was of the secondary variety. In many cases among the more favoured classes the under-nourished children were provided with a great variety of food, but the child would not eat it; he simply had no interest in his food. Apart from gross disease, he was convinced that the chief cause of this state of things was over-strain, mainly psychological. Many children at school to-day were living lives that were far too strenuous, and this reacted directly in inhibiting the appetite. He was sure that insufficient stress was laid on that factor. It was necessary to distinguish between quantitative and qualitative factors; between the amount of body fat and the body weight as contrasted with the subtler differences due to vitamin and mineral defect. The latter were the more difficult to determine. If primary malnutrition existed, what were its consequences? Professor Cathcart had said he would expect improved nutrition to cause an increased resistance to disease, but the speaker was not so certain of that, speaking as a physician. He knew of only one disease in which he felt certain under-nutrition could be said to be a predisposing factor—namely, tuberculosis. Resistance to tuberculosis was, he thought, largely a matter of fat-eating. Following this line of thought, he considered that one factor in the reduction of incidence of tuberculosis in the last decade was the capacity of the working people, with their improved economic position, to purchase and consume more fat. The fat-soluble vitamins might also be a factor. He did not feel at all certain about the other infectious diseases in this respect. Malnutrition mostly was accompanied by other drawbacks, such as bad housing and insanitary conditions generally. He did not agree with giving the infant iron in its feeds because its haemoglobin content was 80 per cent. instead of 100 per cent.; mother's milk probably contained the full quantity which the infant needed. There might be real harm in preaching over-nutrition; humanity had had much experience through the ages in living economically, through stress of circumstances, and had acquired the habit of doing so; it was far otherwise with over-nutrition.

Dr. G. V. ASHCROFT said trials on diets in the case of both patients and staff at an orthopaedic hospital showed that generosity of dietary was well repaid in an enhanced bill of health. Dr. MAGEE thought the present problem was to apply efficaciously to the public the information available on this subject. Even so, much more was known of the nutrition of the rat than that of human beings. Concentrated vitamins might well be dangerous. The efficiency of the neuro-muscular system was a good test of general health. Ignorance on food was not confined to the working classes. Dr. W. G. WILLOUGHBY (Eastbourne) gave examples illustrative of the extent to which the personal judgement of the medical officer influenced the report of the proportion of malnutrition existing. The food question had now become almost a political one. Dr. A. S. M. MACGREGOR averred that there was still a large amount of under-nourishment in the population. He pointed out that in densely crowded and poor parts of large cities the mortality from pneumonia and pneumonic complications following acute specific fevers might be six to eight times as great as that in more favoured areas of those towns. He referred to the more generous scale of feeding recently laid down for school children. Dr. M'GONIGLE thought the medical officer could only express opinions and persuade his committee to spend the money he considered was needed.

The PRESIDENT said there were complementary activities in the body to those directly concerned with food, and they were as important as the actual constitution of the diet. Therefore every effort should be made to improve the habits and the general mode of life of the people. Dr. Hutchison's references to overstrain and lack of sleep and relaxation were most valuable.

Ireland

Irish Medical Schools' and Graduates' Association

The St. Patrick's Eve dinner of the Irish Medical Schools' and Graduates' Association, held at Claridges Hotel, London, was a well-attended function, presided over by Mr. R. Lindsay Rea. One interesting event was the presentation to Sir William de Courcy Wheeler, Past-President of the Royal College of Surgeons in Ireland, of the Arnott memorial medal. The presentation was made by Colonel Moore, who referred to the recipient's long services to the medical profession and, in particular, his personal teaching service. Sir William, in a graceful speech, acknowledged the compliment. The toast of "The Guests" was proposed by Dr. J. E. A. Lynham. The guests included the Marquess of Dufferin and Ava, Sir Richard Winn Livingstone, well known as teacher and writer in the educational world, formerly Vice-Chancellor of Queen's University, Belfast, and now President of Corpus Christi, Oxford, and Dr. S. Watson Smith of Bournemouth, President of the British Medical Association. Dr. Lynham said that the members of the Schools' and Graduates' Association were medical men from all Ireland. The president, Mr. Lindsay Rea, was from Belfast; Mr. James Carver, the dinner secretary, to whom they were all indebted for the excellence of the arrangements on these occasions, came from Cork; the energetic secretary of the association, Mr. C. P. Malley, was a Dublin man, and the speaker himself had spent his childhood in the wilds of Connaught. The membership included practitioners in every branch of the profession, but whatever their status they were all united in affection for the beautiful land of their birth. Most Irishmen were sometimes assailed with nostalgia when they remembered the clouds and sunlight dancing over the hills, the winds blowing from the Atlantic, the curlews circling over the wide bogland, the wild duck in the rushes of the lovely lakes, the scent of the bog myrtle, the glamour of the country fairs, the strains of a fiddle through the open door where the candlelight was gleaming, and the blue peat smoke rising from the cottage chimneys. "Tir nan oge"—it was the land of heart's desire, where the magic dreams of youth transformed a humdrum world with golden mists, and it seemed to be brought nearer by such a gathering as the present. Each of the principal guests made brief responses. The Marquess of Dufferin and Ava said what a pleasure it was to come and dine with medical men from Ireland. Sir Richard Winn Livingstone paid some happy tributes to the medical

profession, where, he said, there was always found the clear head, the firm hand, and the kind heart. A great Greek had rightly said, "Where there is knowledge of the healing art, there is love of men." Dr. Watson Smith said that although bred in "Caledonia stern and wild," he had always appreciated Ireland and the Irish. As President of the British Medical Association he wished to add a further tribute to the work of Sir William Wheeler. He then reminded those present that the association was not a medical society, but a fraternity of people connected with the Irish medical schools. Referring to the ancient association of Ireland with medical learning, Dr. Watson Smith said that medicine was taught in the monasteries of Ireland as early as the eighth and ninth centuries, and Irish monks became renowned professors, travelling as far as Gaul. Then came a decline in education, but in the seventeenth century Queen Elizabeth granted a charter to Trinity College, Dublin, and the great royal university of Ireland was created. Mr. Lindsay Rea concluded with a reference to the kindness which awaited Irish people in England. The Irish had found wonderful friends on this side of St. George's Channel.

Scotland

William Mackenzie Medal

The William Mackenzie medal for 1935, for original contributions to ophthalmology of outstanding merit, has been awarded by the custodians, the Glasgow Eye Infirmary, on the advice of a committee representative of the University of Glasgow, the surgeons of the Glasgow Eye Infirmary, the surgeons of the Glasgow Ophthalmic Institution, and the Fellows of the Royal Faculty of Physicians and Surgeons of Glasgow, to Miss Ida C. Mann, D.Sc., F.R.C.S., who will give an address at the Faculty Hall, 242, St. Vincent Street, Glasgow, on June 7th, when the medal will be presented.

Edinburgh Dental Hospital

Presiding at the forty-third annual meeting of the Incorporated Edinburgh Dental Hospital and School, on March 12th, Professor Sydney Smith said that the past year had been most satisfactory so far as work at the school was concerned. There had been many changes in the curriculum, and various departments had been modernized and re-equipped. The total number of students on the roll had been 187, of whom 166 were working in the hospital. Fifty-one of the students were taking the course for the triple qualification in medicine in addition to the dental curriculum, and thirty-two students had obtained the diploma of L.D.S. of the Royal College of Surgeons during the year.

The annual dinner of the Odonto-Chirurgical Society of Scotland was held in the Hall of the Royal College of Surgeons of Edinburgh on March 9th, under the presidency of Dr. H. M. Sturrock, Edinburgh. Dr. Sheldon Friel of Dublin, in proposing "The Society," said that such societies played an important part in dental affairs. Dentistry had increased in scope so much that it took a considerable number of people working together to do anything in the way of new research. A society could be of enormous assistance to the dental profession if it would adopt some scheme such as that all the meetings of one year should be devoted to one subject, various members reading papers, and a committee reporting at the end of the year upon the result. He would suggest as a suitable subject the question whether deciduous teeth should be removed or what other course should be adopted. Mr. M. N. G. Fallas (Edinburgh), in proposing "The Royal College of Surgeons," said that many changes were taking place in the dental school at present, and the governors were giving particular attention to the dental curriculum. They were anxious to have a complete curriculum with a scientific foundation, but they did not wish to have it redundant, and they desired to combine with this the greatest amount possible of technical and practical instruction. Mr. J. J. M. Shaw, F.R.C.S.Ed., in replying, said that a high standard of work was the only one that would last. Groups of osteopaths and chiropractors and quacks might make claims, but in the long run the public would judge a man and his qualifications on merits, and in this respect he had no fear for the future of the Edinburgh Dental Hospital.

Edinburgh Royal Mental Hospital

The report presented to the annual meeting of the Royal Edinburgh Hospital for Mental and Nervous Disorders by Professor D. K. Henderson, of the chair of psychiatry in the University of Edinburgh and physician-superintendent of the Mental Hospital, deals not only with the Royal Mental Hospital, but also with the Jordanburn Nerve Hospital and several associated nursing homes. The Jordanburn Nerve Hospital, which accommodates fifty patients, admitted 218 cases to the wards during the year, and the nursing homes admitted 121. In the Mental Hospital itself, comprising Craig House and West House, there were 856 patients on the general register on January 1st, 1934, and 869 at the end of the year. Patients admitted numbered 211, including 121 voluntary and ninety certified patients, a total of 1,067 under treatment during 1934. Of these 117 were discharged as recovered or relieved and thirteen as unimproved, while sixty-eight died. Attention is specially drawn in the report to the success of the out-patient clinics. At the Jordanburn Nerve Hospital the 218 out-patients made 1,031 visits. It is pointed out that a department of this kind, which administers to the needs of people who are sensitive and in need of immediate help though not of treatment under mental hospital conditions, is closely akin to the psychiatric clinics found on the Continent and in the United States. It is urged that the therapeutic possibilities of this hospital would be greatly enhanced by the establishment of a well-organized occupational department, and an appeal is made to some philanthropic member of the community to provide the necessary funds. The report comments particularly upon the increasing strain of modern life, and states that the suicide rate of a country may be taken as an index of the stability and orderliness of the population. The statistics for Scotland showed that in 1933 there was an increase of 196 suicides over the figure for 1923, and investigation had demonstrated that the greater number of these occurred in the large burghs. Suicide and psychiatric work were closely related, because the majority of persons who chose to solve their difficulties by suicide were suffering from states of great depression or emotional instability, but in many cases were still worthy citizens. These conditions, of which suicide was frequently the outcome, were transitory, recoverable states. Another factor which should be considered in relation to nervous and mental disorders was the element of fear, which produced anxiety, agitation, sleeplessness, and distress. The psychiatrist was of great importance in treating such patients in the developmental stage of their illness rather than after they had entered a nursing home or hospital. For this reason psychiatry deserved greater recognition than had been accorded it: in the past it had been regarded too much as an institutional affair with little contribution to make to general medicine. On the other hand, it was now being recognized that psychic factors were of value in producing symptoms, even of

organic diseases such as goitre, headache, palpitation, dyspepsia, and dysmenorrhoea. Reference is made in the report to the appeal of psychology and psycho-analysis in the popular imagination, and it is urged that while suitable cases may be recommended for psycho-analytic treatment as much care and discretion should be utilized in choosing them as in advising a major surgical operation. The problems of nervous and mental illness would be better approached from many different aspects than by the utilization of any extremely specialized procedure. Under the conditions of the modern mental hospital, the patient was now treated in a kindly, sympathetic, and skilful manner, and no form of treatment was neglected, but the difficulty still existed of getting the patient to realize when he was in need of help.

Glasgow Sick Children's Hospital

In submitting the annual report of the Royal Hospital for Sick Children, Glasgow, at the annual meeting on March 11th, Lord Provost Sir A. B. Swan, who presided, said that as the result of the jubilee appeal for funds for an orthopaedic department, designed to be the scientific centre of orthopaedic work in the West of Scotland, £49,600 had been subscribed by some 550 donors. Mrs. Pearl Werndorff then intimated that she would give £400 to bring the total up to the £50,000 for which the appeal had been made. The Lord Provost also alluded to an increase of £500 in the annual cost of the milk supply of the hospital. He wished the Minister of Agriculture would have sufficient vision to relieve the hospital from the responsibility of providing this extra amount. At the present time the Corporation of Glasgow was supplying some 12,000 pints of milk at an uneconomic rate to healthy children, while the hospital had to pay the price fixed by the Milk Marketing Board for children who were in poor health. Prior to the activities of the Milk Marketing Board the hospital had had an agreement with a farmer who gave them their supplies; the hospital had been satisfied with the milk and the farmer with his price, but he was now debarred from supplying milk on the old terms. Professor J. M. Munro Kerr, moving a vote of thanks to those who had assisted the hospital, remarked that the past year had been a great one for hospitals in Glasgow; they had all been pursuing a forward policy, showing the value of the voluntary hospitals and providing a good example to industrialists. Prizes and certificates to nurses were afterwards presented by Lady Swan.

Dundee Royal Infirmary

The annual report of the Dundee Royal Infirmary was submitted to the Court of Governors on March 11th by Mr. Athole F. Stewart, chairman of directors, who said that the number of patients admitted to the hospital during 1934 had been 10,780, with a total under treatment of 11,211. This was an increase of 665 over the figures of the previous year. There had been 683 deaths, equivalent to 6 per cent. of the patients treated, and if 200 were deducted from this—being the number of patients who died within forty-eight hours of admission—the percentage was 4.2. The income for the year had amounted to £48,773, which was an increase of £5,884 over that for the previous year. The total expenditure had been £50,200, leaving a deficit of £1,427. It was a matter for regret that they had not been able to get through a year without incurring a deficit, but there was satisfaction in the fact that the ordinary income during the year had come nearer meeting the expenditure than it had done for the past thirty-two years. The directors would continue to pursue vigorously a campaign for increased income until they were able to pay their way without incurring any deficit, and there were good hopes that this result might be achieved by the end of the current year.

England and Wales

The New Westminster Hospital

Plans for the new nurses' home and medical school in association with Westminster Hospital have been approved after circulation to the House Committee and members of the honorary medical staff. Demolition has begun on the new site, which is south of the Abbey, near Lambeth Bridge, and foundation work on these two buildings is actively proceeding. It is hoped that the foundation stones may be laid during June, but that is a matter on which the president of the hospital, the Prince of Wales, is to be consulted. The Building Committee is now considering the requirements and general allocation of the wards and departments for the main hospital building. The committee gratefully acknowledges the co-operation of Westminster City Council and of the churchwardens of St. John's, Westminster, in various structural works which have been necessary in the neighbourhood of St. John's Gardens; the City Council prepared the necessary applications to the Ecclesiastical Commissioners for faculties. The total donations and promises to the building fund now amount to £124,575.

Burrow Hill Sanatorium Colony

The Minister of Health has sent a circular (No. 1463) to county and county borough councils and tuberculosis joint committees in England, reminding them of the facilities provided at Burrow Hill Sanatorium Colony for the treatment and technical education of tuberculous youths between the ages of 15 and 19, and reviewing the present position in the light of reports received from medical officers of the Ministry and from the London County Council in the course of the five years and more which have elapsed since this institution was opened. He urges that more regard should be had to the advantages of the therapy and training thus made available, more particularly because the demand for admission to the colony has been less than was expected. It is pointed out again that tuberculosis in youth is prone to be progressive and fatal, and that its onset so early in life usually interrupts any training for employment—a fact of social and economic significance. Even when recovery permits an entrance into ordinary commercial life there is considerable risk of relapse. The Sanatorium Colony provides convalescent treatment, institutional after-care, and vocational training; education in general subjects, gardening, and clerical work being given by fully qualified instructors. The school attached to the colony is approved by the Board of Education; the technical courses are subject to inspection by the Surrey County Council, and more than half the patients trained there have obtained employment after their discharge. The institution is specially adapted for cases of early or slight disease which have become quiescent or partially arrested after sanatorium treatment, and need further supervision for one or two years more before being able to face the demands of employment in the ordinary way. The risks entailed by not continuing under supervision are often neglected by their parents, who welcome even a small addition to the family income; the consequence is too often that the patient later breaks down completely, and then requires prolonged treatment under the tuberculosis scheme of the local authority, inflicting an additional and unnecessary expense. The Minister of Health expresses the hope that, with these considerations in mind, tuberculosis authorities and their officers will be in a position to impress upon suitable patients the advantages of entering upon a course of treatment and training at

Burrow Hill, and that tuberculosis authorities will be able to make more extended use of the facilities provided by the National Association for the Prevention of Tuberculosis in dealing with the problem of the tuberculous adolescent.

Cheadle Royal

Dr. E. M. Brockbank, the medical historian of Manchester and its Royal Infirmary, has written *A Short History of Cheadle Royal from its Foundation, in 1766, for the Humane Treatment of Mental Disease* (Manchester, Sherratt and Hughes). This was first an expansion of the Infirmary, and in 1850 was moved to Cheadle Royal in Cheshire, nine miles from Manchester. It was originated by the "Trustees for the Public Infirmary at Manchester," because it was found to be "extremely inconvenient to admit poor lunaticks as in-patients." As the declared object of the trustees was "to provide for these miserable objects being carefully attended and *tenderly* treated," Dr. Brockbank loyally claims that Manchester can justly claim to be the first place in England, or indeed anywhere, to have provided a hospital specially for the humane treatment of "such patients as are disordered in their senses." Running parallel with the history of this mental hospital, as it would now be called, there is an account of the fluctuating phases of the medical treatment of the insane. There are also personal sketches of some of the resident medical superintendents of Cheadle Royal; among them was Henry Maudsley in 1859 who, although he had won ten gold medals and scholarships at University College Hospital, London, by the time he was 21 years old, was not considered by his teachers to be as diligent a student of science as he was of cricket. While at Cheadle Royal he wrote a paper to show that Hamlet was not insane. Originally intended solely for the poor, Cheadle Royal now caters entirely for private patients.

The Incorporated Society of Chiropodists

Members and guests of the Incorporated Society of Chiropodists to the number of more than two hundred assembled for their annual dinner at the Trocadero Restaurant on March 16th, with their retiring president, Mr. G. F. Cooper, in the chair. The guests included some fifteen members of the medical profession, one of whom, Dr. T. McWalter Miller of Edinburgh, proposed the health of the society. He said that it was founded in 1912 with a dual aim: to regulate and foster the training of students in the art of chiropody and to improve the status of the profession and work for its recognition. From the outset those who founded the society determined to work in close co-operation with the medical profession. Schools of chiropody had been established by the society in London, Edinburgh, Manchester, and Liverpool, where every student had to undergo a long course of practical training. The society demanded from its members in practice a high ethical standard. They were forbidden to advertise, and were enjoined only to take cases suitable for chiropodical work and to refer to members of the medical profession all cases about which there was any doubt. Attached to the schools were a number of foot hospitals or clinics, where many thousands of patients were treated every week. In the clinic attached to the Edinburgh school last year some 15,000 patients were treated. The foot hospitals also brought home to the public and to the medical profession the vast amount of minor foot trouble which existed and about which usually people did not consult their doctors. Dr. Miller felt that doctors were increasingly appreciative of what a skilled chiropodist could do. Several general hospitals of recent years had opened departments of chiropody, staffed by members of the society. The society had been making an attempt, not yet successful, to obtain a charter. Unfortunately, a recommendation that some degree of recognition be given to the chiropodist was defeated at the last Annual Representative Meeting of the British Medical Association, but there were aspects even of that event which were not discouraging, for the recommendation was brought forward by the Council of the Association, and was defeated not so much on its merits as on its manner of presentation and wording. Mr. Cooper, the president, in replying, also spoke appreciatively of the encouragement afforded by the Ethical Committee and Council of the British Medical Association and by the Royal Colleges in the effort for recognition. The toast of "The Foot Hospitals" was proposed by Mr. G. Perkins, F.R.C.S., and responded to by Sir Henry McMahon, who said that at the London Foot Hospital 40,000 patients were treated last year, a threefold increase on the number two years ago. There were five foot hospitals in various parts of the country, but they could be multiplied to great advantage in the large centres of population.

Laboratory Services and the L.C.C.

The northern group laboratory, which was established to serve the needs of the L.C.C. hospitals in North London, has hitherto been located at the North-Eastern Hospital (South Tottenham). Owing to the reconstruction of the hospital, it is now necessary to pull down the temporary building in which the laboratory has been housed, and it is considered that as the North-Eastern Hospital is not as conveniently situated for the purposes of the group laboratory scheme as the North-Western Hospital (Hampstead) a new laboratory should be built on a site within the curtilage of the latter institution. The location of the laboratory at the North-Western Hospital, where the Council's puerperal fever unit is situated, will also have the effect of facilitating the research work which has been proceeding at the hospital for many years into the causation of that disease. A plan has been approved for the erection of a main laboratory building of two stories and a detached single-story building.

FORLANINI INSTITUTE: SCHOLARSHIPS

The Italian Fascist National Federation Against Tuberculosis has placed at the disposal of the International Union Against Tuberculosis six scholarships at the Carlo Forlanini Institute in Rome. The conditions are as follows.

These competitive scholarships, of a value of 3,000 lire respectively, plus board and lodging, are intended to enable foreign medical practitioners to stay at the Carlo Forlanini Institute for the purpose of following a course of studies. This stage of eight months will correspond with the academic year (from November 15th to July 15th), including the usual holiday periods. The scholars will reside at the institute.

The scholarships will preferably be awarded to young physicians who are already familiar with tuberculosis problems, and who wish to improve their knowledge of this branch of medicine. The kind of work undertaken at the institute will be subject to an agreement between the director of the institute and the candidate. The publication expenses resulting from this work may be defrayed partly or entirely by the institute.

No candidature will be taken into consideration unless it has been forwarded by a Government or association belonging to the International Union. The names of British candidates, accompanied by particulars as to their age, qualifications, and professional experience, must be forwarded not later than June 15th, 1935, to the secretary, National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1.

CORRESPONDENCE

The number of letters received for publication is so large that we must ask correspondents to make their points briefly and to regard 600 words as the upper limit of length.

Post-mortem Examinations

SIR,—In his letter in your issue of March 16th (p. 563) Dr. F. E. Loewy pleads effectively a useful cause. It will be allowed that a wider cultivation of the practice of post-mortem examination would increase the confident technical knowledge of the medical practitioner and would thus contribute both to the practitioner's efficiency and to the public welfare. Equally it is true that once he has completed his curriculum the practitioner has only rare opportunities of continuing his education in this direction ; and, again, that this position is due partly to a failure on the part of lay opinion to appreciate the importance of the issues involved.

To attempt to remedy these defects I have on various occasions made two proposals. One, that the post-mortem room of each local hospital (and the same may apply to a public mortuary) should be open to the practitioners of the neighbourhood, and that any practitioner who desired should have his name entered on a register and should receive an intimation, say, by card or telephone, when a post-mortem examination has been arranged. Here is an opportunity for education which lies close to the practitioner's hand, and it is little, if at all, utilized. No doubt the maximum benefit of a necropsy is for those who have studied the case clinically, but even for others who are not in this position the methods adopted and the facts displayed may be sources both of interest and of instruction.

To educate the opinion of the layman rests largely with the individual practitioner, but a corporate activity is not impossible. Some years ago I suggested "the public values of post-mortem examinations" as a suitable topic for discussion in the Sociological Section of the Annual Meeting of the British Medical Association, and, although another text was then preferred, the exclusion, I imagine, is not necessarily final. Whether, as Dr. Loewy suggests, a new society is advisable, and a gratuitous service, may be open to question. In the meantime, available means might be more widely employed. And these include, as I have many times proved, in addition to the suggestions here proposed, the services of a competent assistant, obtained through the Clinical Research Association for a very modest fee. On the general question, if I may quote from a former contribution, I would claim "that with a true understanding of the position, lay and public opinion, so far from objecting to an examination, would insist on it, at least in any case attended by an appreciable degree of obscurity or doubt."

Dr. Loewy has a good cause, and I hope he will continue to advocate it.—I am, etc.,

London, W.1, March 18th. C. O. HAWTHORNE.

The Report on Fractures

SIR,—It would be unfortunate if the soundness of the main recommendations of the British Medical Association Committee on Fractures were obscured by the prominence of certain questionable features.

In the first table the occupation is not specified, and it is glibly suggested that this is a variable factor which will cancel out in a sufficiently large series of consecutive cases. Such an assumption might be true if the source of supply were varied, but not when the source of supply remains constant. For example, in the statistics which appear later with regard to Pott's fractures there were 300 clerical patients and 100 manual workers. Is 400 not a large enough number of consecutive cases? And if there were 800 from the same source would the proportion be altered? The average period of disability would be materially different in a series of 75 per cent. manual workers and 25 per cent. clerical. And if a man's disability ends when he is told he is fit for work, and not when he returns to work, then the period will partly depend on the optimism of the surgeon. From my own experience I know that as far as one series is concerned this factor is certain to keep down the disability period. If allowance is made for these factors there is nothing unusual in the figures in Table I. Table II is so placed and titled as to give the impression that unorganized clinics yield the figures in it. To present them for comparison with Table I in this way is so obviously unsound. If I were to produce a table of patients treated at an organized clinic and referred to me for a report, the disability period would be very much greater than that given by the clinic itself. Moreover, the patients in Table II are from a very varied source compared with those in the first table.

Quite apart from the tables, some of the statements are at least disputable. For example, it is contended that uninjured joints become stiff through disuse alone, and lack of mobilization accounts for prolonged disability in a *large* number of cases ; whereas in the previous paragraph it is urged that joints near the fractured bone (and therefore injured and more likely to be the site of adhesions) should be immobilized for a long period.

Injuries should include not only fractures of bones, but also the trivial injuries which have been lightly dismissed by the committee. It is very often the trivial injury, treated in a trivial way, that leads to longer disability than a serious fracture to which every attention is paid.

In my opinion co-operation between employer and surgeon is of paramount importance. The success of the hospital at Crewe and the figures for steamship and bus companies support this view. Much time can obviously be saved if employers will co-operate with responsible surgeons, otherwise the man's fitness for some work which would facilitate and expedite recovery is used only as an excuse to reduce his compensation, thus driving him into legal proceedings, which delay indefinitely his return to full work. It is to be hoped that the recommendations of the committee will be put into practice, especially the excellent idea of rehabilitation centres, and that great benefit will accrue not only to the employers, whose interests have been well put forward, but also to the patients, with whose welfare we as doctors are primarily concerned.—I am, etc.,

Liverpool, March 12th. BRYAN MCFARLAND.

SIR,—Mr. Alan Malkin and Dr. Gwynne Maitland show by their letters that they are quite unaware of the problem before them. The former thinks that whether the fractures should or should not be treated exclusively by the surgeon most competent to do so "is purely a question of good will between colleagues": the latter "that time itself will soon remedy this particular complication." Pious generalities such as these will not get us any further. It is because these methods have been tried for years and years that the present unsatisfactory state of affairs exists. If the committee really wishes to accomplish something, it must stick to its guns: having stated that "segregation, continuity, and after-care achieve their greatest value only if there is unity of control" there is no room for compromise.—I am, etc.,

Stoke-on-Trent, March 16th. PAUL BERNARD ROTH.

Gastrectomy

SIR,—In 1929, while on a visit to the clinics in Vienna, I noted that the Austrian coins bore the head of Billroth. It was the Austrian way of commemorating the centenary of the birth of this great surgeon. Two years later, while again visiting these clinics, I was reminded that it was the fiftieth anniversary of the first successful resection of the stomach performed by Billroth in 1881. I went with a number of American acquaintances and saw this very specimen in the museum, along with its history. We were allowed to photograph it. To-day this operation of partial gastrectomy is not only popular, but, as Mr. W. H. Ogilvie in your issue of March 9th ably points out, is the correct treatment for many conditions of the stomach that were formerly treated by gastro-enterostomy, Finney's operation, and the like.

I have assisted both Finsterer and Polya with their particular operations for gastrectomy, and I have witnessed Schoemaker perform his own particular operation. I cannot agree with Mr. Ogilvie, however, when he says that gastro-jejunostomy "must go," for it has its place. It is eminently suited, and I think the correct treatment, for those cases of extreme pyloric obstruction characterized by bulky vomiting and wasting. These cases, in my experience over a good many years, do extremely well with posterior gastro-enterostomy, and the benefit is permanent. There is no doubt whatever that gastro-enterostomy has been abused in the past, and that many cases have been submitted to this operation which were eminently those for medical treatment, hence the numerous failures that we find besieging our clinics to-day.

As to choice of operation, after performing more than two hundred operations for partial gastrectomy I am wholly at one with Mr. W. H. Ogilvie. The operation of partial gastrectomy (I practise Finsterer's), if performed under regional combined with splanchnic anaesthesia, is practically shockless. I have always, however, employed a suitable amnesic in addition to this type of anaesthetic, as I find the results are more satisfactory when the patient is completely oblivious to his surroundings. Inhalation narcosis for this type of operation is a danger, and has now long been discarded in most up-to-date clinics.—I am, etc.,

Bradford, March 18th. BASIL HUGHES.

SIR,—I am grateful to Sir William de Courcy Wheeler for his observations on my paper on gastrectomy. He tells us that the case against gastro-jejunostomy has broken down. Had he seen the many letters I have since received, both from surgeons and physicians, I doubt whether he would still be of the same mind. When he has had time to appreciate the tally of the failures of gastric surgery that abound in this unhappy city alone, he may become a more eloquent prosecutor than I can ever hope to be. I feel, in any case, that we differ in detail only.

With Mr. Walton my disagreement is more fundamental. I hope, however, that his charge of dogmatism, a vice I have tried sedulously to avoid throughout my career as a surgeon, will not be upheld. The statements in my opening paragraph were not accompanied by the evidence upon which they were based because that evidence had been set forth in considerable detail (*Lancet*, February 23rd, 1935) only a fortnight before, and because repetition of the same pleading in a paper concerned with technical details rather than principles would have made it a document of intolerable length. The evidence is all there, the analysis is impartial, the conclusions are, I think, fair ones, and in any case they are acceptable to the great majority of my contemporaries. The collective investigation of the Association of Surgeons, which Mr. Walton says I have not even considered, is discussed fully. While it may enhance the reputation of British surgery in striving to arrive at fair and honest conclusions, it is a terrible indictment of gastro-jejunostomy when performed for any condition but old-standing pyloric stenosis. For this I should unhesitatingly use it myself, and have done so three times in the last month.—I am, etc.,

London, W.1, March 18th. W. H. OGILVIE.

Hypertrophic Stenosis of the Pylorus

SIR,—I have read with interest the opinions expressed by Dr. Poynton, Mr. Twistington Higgins, and others, regarding the importance of feeling the pyloric tumour in hypertrophic stenosis of the pylorus. Without wishing to criticize such authorities on the subject, I venture to suggest that they are, perhaps, somewhat overstressing the importance of palpating the tumour in every case. In the Edinburgh series published by Mr. L. B. Wevill and myself (*British Medical Journal*, June 30th, 1934), we recorded that the pyloric tumour was felt in only 24 per cent. of cases. Furthermore, a significant fact is that all the cases in this series were proved to have pyloric hypertrophy at the time of operation, showing that an accurate diagnosis may be made quite irrespective of palpating the tumour before operation. My argument is that if Dr. Poynton and Mr. Twistington Higgins insist on the tumour being felt before a diagnosis of pyloric stenosis is made then an increasing number of cases of this condition will be overlooked by the busy practitioner, who frequently has neither the time nor the necessary experience to elicit this sign. Finally, I would suggest that palpation of the tumour is desirable and should always be attempted before operation, but that the diagnosis of pyloric hypertrophy can be made with certainty without any tumour being felt.—I am, etc.,

Edinburgh, March 12th. H. L. WALLACE.

SIR,—I am afraid that Dr. H. C. Cameron's attempt to pour oil on the troubled waters has only confused the issue. There is no doubt that it is spasm of the hypertrophied pylorus which is one reason for the closure of the pyloric canal and the symptom of vomiting, but it is certainly not the cause of the palpable tumour. Like Mr. Twistington Higgins, I consider a palpable tumour not only the most significant but also the most constant sign of the condition. I wish that there were other such constantly elicited and constantly significant signs of any individual disease process.

I admit, of course, that the hardness of the tumour may vary from time to time, but it never disappears, as Dr. Cameron implies, during the whole course of the mischief. In support of this statement I would point out that once the tumour has been detected it is invariably able to be demonstrated at any time if sufficient care is taken. And, further, an easily palpable tumour may be present, as I have observed, even although there is no, and has never been any, vomiting.

In my experience clinicians who do not believe in the constancy of a palpable tumour in hypertrophic pyloric stenosis do not take sufficient pains to detect it. As Mr. Twistington Higgins says, the patient must be lying quietly and comfortably, the abdominal wall warm, as also the hands of the examiner, and because it is not always situated at the same spot, and is sometimes palpable most easily with the stomach full and at other times with the stomach empty (and thus may require the passage of a stomach tube or the giving of a feed), the

examination may take anything from fifteen to thirty minutes. The time required for the examination is indeed at the root of the matter, and most clinicians who cannot feel the tumour are impatient.—I am, etc.,

London, W.1, March 16th. LEONARD FINDLAY.

SIR,—Dr. H. C. Cameron casts doubt on the existence of pyloric spasm, and, indeed, the condition, if it occurs, must be rare, for in seventy-three consecutive cases of pyloric obstruction at the Infants Hospital, Westminster, a definite (and correct) diagnosis of pyloric stenosis was made in sixty-nine. The remaining four cases presented all the classical signs of stenosis except tumour, but the symptoms were either very mild or transient. Gastric delay was demonstrated radiologically, and alkalosis was present. In one of these cases, with six days' history of vomiting, the alkali reserve had nearly trebled, and plasma chloride had fallen by 30 per cent. Yet in five more days vomiting had ceased and the blood chemistry was nearly normal. Possibly this was an example of pyloric spasm, but it may equally well have been pyloric stenosis in which the obstruction, though marked, was only transient.

In about 90 per cent. of pyloric obstruction cases either alkalosis or reduction of blood chloride, or both abnormalities, will be observed. Such findings are rare in non-obstructive vomiting, and are hardly to be anticipated in peristole of the cardia, where vomiting occurs very soon after the ingestion of food.—I am, etc.,

University College Hospital, March 18th. MONTAGUE MAIZELS.

The Climacteric

SIR,—I am, I feel sure like many practitioners, in cordial agreement with Dr. Whittingdale in his paper published in your issue of February 9th, and with Dr. Margaret Basden, in her letter in the *Journal* of March 9th (p. 500), in their reference to the scant attention paid to the treatment of the disorders of the climacteric.

Week after week in our practices we are presented with cases of miserable women, all giving a history of mental and physical troubles varying in detail and degree. They can all be included in one group of very real suffering, ranging over a time during which, at some period, menstruation ceases, the post-menstruation section of which is, as a rule, in my experience, more severe and prolonged. The psychical picture may range from a mild depression and failure to adapt themselves to their environment to a condition indistinguishable from a true manic-depressive psychosis.

We are all aware that endocrine dysfunction is at the bottom of the trouble, but my experience does not lead me to agree with those who record real success with oestrin therapy alone. I have used it for years, and recently in massive doses of the various brands—progynon, oestroform, menformon, etc. Though I find it relieves some of the physical symptoms—sweating, flushings, and so on—I feel the problem is not quite so simple, for the low blood pressure, menopausal "rheumatism," and particularly the psychoneurosis accompanying the condition, do not improve in the majority of cases. I think it is time our endocrinologists stepped in and suggested some clinical application of their new knowledge of hormone balance, which in this particular illness is disturbed by the withdrawal of the oestrual content from the ductless gland partnership. No amount of psychotherapy—which, when all is said and done, is no more than explanation of the cause of their troubles, encouragement, occupational treatment, or, finally, incarceration in a mental home—will ever cut short the misery or permanently restore to health these victims of their sex. It is surely unscientific to apply psychotherapy to cure the mental troubles of the menopause when it is now abundantly clear that they are but secondary effects of the primary upset of the endocrine balance in the body—as unscientific as to apply psychotherapy to a cretin instead of feeding it with thyroid.

May I, finally, state my disagreement with the last words of Dr. Margaret Basden's letter? I can assure her that climacteric disorders now loom up more prominently in my practice than they did twenty years ago, and that I find the modern woman, with her "adequate education and purpose in life," as prone, if not more, than her mother to wilt bodily and spiritually during the climacteric.—I am, etc.,

G. E. BELLAMY, M.R.C.S., L.R.C.P.

Dover, March 10th.

Otitis Media in Scarlet Fever

SIR,—With some little experience of acute otitis media in scarlet fever I find myself strongly of the same view as Mr. Wm. Wilson. Mastoiditis is often latent, and when the surgeon comes to perform the operation he is often astonished to find so much destruction. But in addition to that I should like to mention what I have found to be rather a curious fact, and that is, that if the mastoid process and cells are opened only so much as to furnish what is merely simple drainage, that will be quite sufficient to cure the disease. The wide open exenteration of all the cells in such wise as to remove everything but the mastoid cortex is, according to my results in these scarlet fever cases, unnecessary; and indeed it may be harmful by exposing a large open area to infection. That being so, I find that a simple linear incision about an inch long, placed rather anteriorly, with an opening in the cortex and cells to correspond, is enough to drain sufficiently the mastoid process and cells. It has the further advantage of not exposing any more of the soft, uninfected tissues to infection from within than is absolutely necessary. One point, however, is of the first importance. The clearance of the mastoid cells must be so effected as to ensure free and direct drainage between the mastoid antrum and the post-aural wound. And furthermore, every care must be taken to lay freely open the mastoid cell of the apex as well as every other outlying cell. This, by the way, can be perfectly well done through the small incision and opening in the bone. But—and the proviso is of some importance—the surgeon who undertakes this modification must have had some experience in mastoid surgery. Otherwise, it would be much safer for him to stick to the large, open, orthodox operation.—I am, etc.,

London, W.1, March 16th. DAN MCKENZIE.

Encephalomyelitis Simulating Diphtheritic Paralysis

SIR,—In your issue of March 16th (p. 523) Dr. Wyard and Dr. Hobhouse reported four cases of encephalomyelitis simulating diphtheritic paralysis. Those cases were all seen in December, 1934, and January, 1935, and the writers suggest that this may be a type of encephalomyelitis prevalent at the moment. I think it may be interesting, therefore, to record the following case, which came under my care on February 11th at the Belgrave Hospital for Children.

Male, aged 1 year 11 months. Previous to this illness child could stand and walk without support. No history of diphtheria or sore throat. Ten days before admission he "went off his feet," and staggered about when trying to walk. There was no apparent pain, and the child then did not appear ill.

On admission there was marked weakness of the muscles of the arms, legs, and neck, but no definite paralysis and no wasting. The deep reflexes were absent. There was some weakness of the palate, with difficulty in swallowing; also slight facial paralysis of the supranuclear type on the right side, and definite right internal squint. Muscle reactions tested on February 20th were normal.

Cerebro-spinal fluid on February 14th was under pressure, and was examined by Dr. Olive Buckley, who reported as follows: "Clear; no clot; 8 cells per c.mm. Total protein 0.14. Globulin and sugar normal. Chlorides 0.71. Culture sterile." This shows a marked increase in total protein. A throat swab was negative to Klebs-Löffler bacillus. The child has made an excellent recovery, and is now up, the only remaining sign being a slight squint, which appears to be gradually getting less.

This case, which I had regarded as one of diphtheritic paralysis, appears to be of the same type as those reported by Dr. Wyard and Dr. Hobhouse, and supports their view that this type may be prevalent at the moment.—I am, etc.,

London, W.1, March 18th. HUBERT M. ODDY.

Youth and Social Hygiene

SIR,—This year has seen the launching of a number of appeals to public benevolence on behalf of various useful and desirable institutions and objects. One of these has a special medical interest and importance, and we ask the courtesy of your columns to say a word in its support, and to bespeak for it the sympathy and encouragement of the profession.

The British Social Hygiene Council is this year celebrating its twenty-first birthday, and the completion of a period of national public service of no ordinary merit. It came into being to fight the scourge of the venereal diseases, whose appalling ravages were disclosed, to the surprise and alarm of the public (and even of the medical profession), by the Royal Commision of 1916 and by the Army medical reports. Repeated tributes to the educational part played by the council in the success of the treatment centres, set up by the Government and the local authorities, have been paid in the highest medical and administrative circles. This vital educational work is still needed if the progress made in the years immediately following the war is to be maintained. A heavy toll of private tragedy and public expenditure is still being paid.

In the further pursuit of its objective the council (which has been fortunate in the number of distinguished laymen and medical men and women who have directed its efforts) extended its scope in 1925 to include positive health teaching for the younger generation, and for those responsible for its training either in schools or in youth organizations. This work has revealed a vast need (not being met otherwise), and awaits an expansion amounting to urgency, which the present financial resources of the council cannot meet. His Royal Highness the Prince of Wales has brought before the country the supreme importance of safeguarding the health and welfare of our young people. These young people—if they are to come safely to manhood and womanhood in the difficult conditions of to-day—must be given knowledge of themselves and be impressed with the importance, for the individual and the community, of the control of the racial instinct. We know of no organization so well qualified in its policy, its personnel, and its equipment to help those who are undertaking this great national service.

The council's achievements are not confined to these islands but have Empire significance, and in India and the Colonies much-needed stimulus has been given to hygienic progress. Wherever it is possible, therefore, we would ask for the co-operation of members of the medical profession in ensuring the success of the appeal by the British Social Hygiene Council to enable its important educative work, particularly amongst adolescent youth, to be continued and developed along the broad national lines already planned by the medical and educational advisory committees of the Council.—We are,etc.,

HORDER.
KENNETH M. WALKER.
DAVID NABARRO.
MARGARET RORKE.
T. DRUMMOND SHIELS.

Carteret House, Carteret Street, S.W.1, March 18th.

Kent County Cancer Appeal

SIR,—My attention has been drawn to a discussion at the Medical Society of London on radium therapy, its value and limitations, at which Dr. Malcolm Donaldson is reported as saying "it was unfortunate that radium in small packets should be spread all over the country, yet what could one do when the Archbishop of Canterbury appealed in the *Times* for more radium for small hospitals in Kent." I have the honour to be the medical adviser to the Kent County Cancer Appeal Fund. The Archbishop of Canterbury is one of our patrons, and the Appeal Council has been influenced by the advice that I have given them. It is necessary, therefore, to point out that Dr. Donaldson can have no real conception of what we are trying to do in Kent, while his remarks as to "radium in small packets" are utterly misleading.

Our policy has been based on the concrete fact that the scourge of cancer must be attacked by early diagnosis and by the admission of the patient to a well-equipped hospital, manned by a good surgical staff and possessing pathological, deep *x*-ray, and radium departments, staffed, if possible, by specialists. My council, with these basic principles in view, have so far assisted *two* hospitals: the Kent and Sussex at Tunbridge Wells, and the hospital of St. Bartholomew at Rochester. The former hospital fulfilled all our requirements with the exception of radium, and, in consequence, we offered them 250 mg. radium at a cost of £3,000. The Rochester hospital lacked a deep *x*-ray department, but welcomed our offer of radium on condition that they made up for the deficiency. This they are doing. The amount of radium which we offered was subjected to careful preliminary investigation, my advisers being Mr. Rock Carling and Professor Hopwood, both of these authorities coinciding in their views that 250 mg. was the minimum amount that could serve a useful purpose for such hospitals as the Kent and Sussex and St. Bartholomew's, Rochester. Moreover, the offer of radium was subjected by my council to certain conditions, all of which were readily accepted by the committees of the hospitals in question.

These conditions were as follows: that the hospital should provide a weekly cancer clinic; that every doctor serving the hospitals should be notified of the establishment of the clinic; that the clinic should be advertised in the local press; that all cancer cases should be recorded, tabulated, and followed up; that the clinic should be supervised (if I may use the term) by a London surgeon skilled in radium therapy, acting in an advisory capacity; that a close contact should be established between the "small" hospital and Mount Vernon; that waiting lists should be abolished; that all unusual or difficult cases should be transferred without delay to Mount Vernon; and that a close co-operation should be established, so far as was feasible, between the voluntary hospital and the county hospitals in the immediate neighbourhood.

In respect of the light-heartedness with which Dr. Donaldson speaks of the "small" hospitals in Kent, has he visited the new hospital at Tunbridge Wells, and

does he know that St. Bartholomew's at Rochester ministers to a population of over 180,000 people?

These facts will, I think, throw a new light on the Kent County Cancer Appeal, our sole purpose being to attack cancer, whether by providing radium, assisting in the provision of deep *x*-ray therapy, encouraging pathology, or in any other way that seems best. I have heard recently that Tunbridge Wells has secured its radium, that its cancer clinic is to be started immediately, and that all our conditions are acceptable. Rochester will follow suit, subsequent to which we shall proceed to assist wherever we can.—I am, etc.,

L. BATHE RAWLING, F.R.C.S.,
Consulting Surgeon, St. Bartholomew's Hospital.

Littlestone, Kent, March 18th.

Sir James Mackenzie and Osteopathy

SIR,—In your very full report of evidence before the Select Committee of the House of Lords on registration of osteopaths one witness quoted words from *The Future of Medicine*, by that eminent clinician Sir James Mackenzie, suggesting that they could be regarded as favourable to osteopathy. This is the quotation in full:

"The fact that the great majority of persons suffer from tubercular infection, but that only a few—and these living often under the best hygienic conditions—develop consumption suggests that there is some other factor at work than the tubercle bacillus."

The claim put forward is that osteopaths are dealing with "the other factor." It seems desirable to view another passage from the same book.

"It might be said that the general practitioner of medicine has had, from all time, the opportunity for investigating disease in the manner I am advocating, and that he has failed to utilize this for the advance of medicine. In one sense this is true, though it should be remembered that up till recent years the teachers of medicine and those who have done so much to advance our knowledge have been to all intents and purposes general practitioners such as Harvey, Hunter, Jenner, and many others."

In this book and in other writings Sir James advanced practical suggestions for reform in medicine. In all his writings, however, he made it quite clear that there might, with advantage, be changes within the profession, but never satisfactory replacement by any alternative such as osteopathy.—I am, etc.,

Bourne, Lincs, March 18th. W. B. R. MONTEITH.

European Children in the Tropics

SIR,—Having practised in Batavia (Java) for twenty years I feel entitled to comment on the question regarding European children in the Tropics, which was raised in the *British Medical Journal* of December 1st, 1934 (p. 1025) by Dr. James Gardner. His statement is not entirely correct on one point. The Dutch in Java also go to the mountains during the school holidays, as much as they can afford. On such occasions children who were tired and pale are seen to resume the healthy "European" looks within two days, which proves that the influence of life in the hot climate is, as a rule, very superficial.

The principle of the Dutch colonizers has always been to keep up family life. Often British people visiting Batavia told me how they were struck by the sight of hundreds of European school children going home at noon on their bicycles. As a rule the Dutch keep their children with them in the Tropics until they are 14 or 15 years old, sometimes even longer. The schools are on a level with this custom. In consequence the women do not crave for going back to Holland sooner than their husbands. (Dutch officials and Army officers stay, as a rule, six to eight years in the colonies before being entitled to European leave.)

Of course, the British people could do the same if they would like to do so, and here lies the whole gist of the matter, for a powerful prejudice prevents them from following the Dutch example. I have known a few British families who did, but they are exceptions. This prejudice is deeply rooted and entangled with national and traditional feelings.

No stranger has a right to criticize the deeply felt prejudices of another nation, and therefore I only state the facts: (1) The average Englishman does not like his children to be born in the colonies, whereas the Dutch do not mind this in the least. (2) The Englishman wants his sons to be educated—if he can afford it—at a public school, whereas the Dutch parents prefer to keep their children at home. (3) Apart from this, the Englishman strongly prefers his children to pass their childhood in Europe, whereas the Dutch accept the disadvantage of an education in the colonies as a necessity. These are the facts, which it is not possible to justify by scientifically proved medical theories, for the simple reason that there is no medical aspect to the question, which amounts to the old saying, "So many countries, so many customs."—I am, etc.,

Monte Carlo, March 2nd. B. VAN TRICHT.

"Art and Fashion in Medicine"

SIR,—The members of the British Medical Association are privileged, from time to time, through the medium of the *Journal*, to read weighty pronouncements on the philosophy of medicine, the history of medical progress, and the present position of medical science; delivered by those who are, no doubt rightly, regarded as the leaders of the profession. While duly grateful for the wealth of wisdom thus made available to the humblest practitioner, the latter is nevertheless entitled to demand that these pontifical pronouncements, seeing that they are usually pleas for a more scientific approach to medical problems, shall themselves be free from distortions of fact, whether wilful or ignorant.

It is against such a distortion of fact in the Sir Charles Hastings Lecture, by Sir Walter Langdon-Brown, that this letter is a protest. After insulting the hundreds of homoeopathic physicians in this country, who are, after all, fully qualified medical men pursuing their work with due regard to the ethics of the profession and in the spirit of the Hippocratic Oath, by classing them with osteopaths and Christian Scientists, he attacks their basic theory on three grounds—first, that homoeopaths call those who differ from them "allopaths." This seems harmless enough, but the sting in it is apparently that the "allopath" does not "study the reactions of the individual to the invasions of disease," and is not "prepared to adopt any means that offer reasonable expectation of helping the patient." Can Sir Walter Langdon-Brown truthfully state that the "allopath" *does* study the reactions of the diseased individual, noting *all* the deviations from the normal caused by the disease? One doubts it. But this very attention to detail is a matter of routine to the homoeopath, who does not consider that he has "taken the case" until he has investigated the totality of the patient's altered response to several environmental factors. As to the readiness of the "allopath" to adopt any means that offer reasonable expectation of helping the patient, has Professor Langdon-Brown heard of the offer of the homoeopathic practitioners of Glasgow to take over a ward in one of the public assistance hospitals, so that the relative merits of homoeopathy and orthodox medicine might be demon-

strated, and how that offer was turned down as not being "in the public interest"? The term "allopath" is not used by the homoeopath in an abusive sense, but if Professor Langdon-Brown interprets it in such a way as he indicates there is surely some justification for its continuance.

Secondly, the homoeopathic position is attacked because of the so-called fallacy of Hahnemann's original experiment with cinchona bark. Professor Langdon-Brown dismisses the whole affair by saying "Hahnemann nauseated himself by a large dose of cinchona bark, and like many severely nauseated persons, he shivered, etc." If he had read Hahnemann's description of his "proving," he would have seen that Hahnemann *did not shiver*. He experienced all the symptoms of malaria without the rigor. Nor does he mention nausea. As to the reliability of Hahnemann's observations on this subject, we may quote Professor Lewin, the Berlin pharmacologist, who says that quinine fever occurs fairly frequently, and in sensitive individuals may be provoked by very small quantities of cinchona. He adds that the frequently doubted observations of Hahnemann in himself must be considered reliable.

The third indictment is that in some "standard textbook of homoeopathy" he came across a statement that small doses of quinine were all that were required in malaria. If he did come across such an unqualified and dogmatic statement, which one doubts, then all one can say is that that is *not* homoeopathy, and that its lack of relation to the homoeopathic principle should be obvious to anyone who considers himself sufficiently conversant with the subject to make public pronouncements about it.

Homoeopaths welcome discussion of the principle of therapeutics which they are using every day in all kinds of diseases. They are not averse to criticism. They do *not* make of their principle a "creed," unless one regards as a creed any generalization that has outlived the majority of generalizations. The practitioners of homoeopathy do demand, however, that pronouncements of this kind, which inevitably find their way into the public press, shall not take the form of ignorant criticism. One must remember that the public is not impressed by quacks only; it is impressed also by Regius Professors of Physic.—I am, etc.,

F. BENNETT JULIAN, M.B., Ch.B.

Liverpool, March 16th.

Snake Venom in Therapeutics

SIR,—It is almost a hundred years since Constantine Hering made his preliminary investigations into the effect of snake venom on the healthy subject, and from that time (1837) snake venoms have figured prominently in the practice of skilled physicians. The school of medicine where their value has been so constantly acknowledged is in homoeopathy, and as a collateral note to your important annotation of March 2nd the following will be of interest.

Bothrops lanceolatus (yellow viper), *Cenchris contortrix* (copperhead snake), *Crotalus horridus* (rattlesnake), *Elaps corallinus* (coral snake), *Lachesis mutus* (bushmaster snake), *Naja tripudians* (cobra), as well as *Vipera berus*, *V. aspis*, and *V. torva*, have all had their share in supplying data at various times within the past century, and it would well repay those interested to follow up this literature in the homoeopathic materia medica. One of the interesting points which those venoms present has of late been rediscovered in the application of snake venom for haemophilia. It would be a pity if other applications were overlooked, and one which lends itself in appropriate cases is in the treatment of many of the menopause disturbances.

Lachesis is the venom which has commanded most attention, probably because it has had the most thorough proving. One of the minor uses is in the treatment of epistaxis if that comes, as it so often does, when the menstrual flow begins to be erratic at the climacteric. Observing the relief that lachesis may give to a patient tormented with those strange nervous disturbances which accompany the flushes of heat that mount to the head, her physician knows that all the past research has not been in vain.

The strength of the dose does not require to be anything approaching a toxicological effect. The "sixth centesimal potency" as used frequently in homoeopathic practice will give good enough results to make further investigation by the practitioner seem imperative.—I am, etc.,

WILLIAM R. MCCRAE, M.B., CH.B.

London, W.1, March 2nd.

Fog Glasses for Cars

SIR,—I have only just had the opportunity of reading, in your issue of January 26th, the results of your extended tests on nebulite and the subsequent discussion of the problem of motor head-lamps in fog. The laboratory tests described have been amplified by me both visually and photographically, using spectrophotometers specially designed for the purpose. I, too, investigated the possibilities of a selenium cell for this type of work, but discarded it because, its sensitivity curve being so different from that of the human eye, its records were not trustworthy.

In addition to these measurements upon the light transmitted by nebulite and many other fog-lamp glasses, I have made similar tests upon the light transmitted by fogs of many types, natural and artificial, extending over a number of years. I fear that I cannot entirely agree with your contributor's statement that "back-glare in a fog is no more and no less than the reflection of the light from the innumerable particles of moisture which make the mist." This may be true to some extent in the very wet type of fog, where the particles are large, but in the more common type the particles are small enough to cause a considerable amount of "scattering," and physicists distinguish between scattering and reflection, since the physical laws governing these two phenomena are essentially different.

But the final test of any fog-light is the experience of drivers sitting behind the lamp in a fog. The gentlemen who carried out the road test which is incorporated in your report found no benefit from the use of nebulite. They are by no means alone in this decision. Yet many equally competent observers have found great benefit in its use. The integrity of both classes is beyond question, and we must look for the cause of this difference either in a variation in the properties of the fog or in the nature of the reaction of the eyes of the observer to the stimulus of the light concerned. If the fog is of the very heavy wet type, composed of such large particles that the whole of the back-glare is due to reflection, it is obvious that no light filter can give any relief. But this is a rare occurrence, and in the vast majority of cases some (often much) of the back-glare is due to scattering, and a correctly filtered light will eliminate this to a great extent.

There is another aspect of this matter, however, to which, so far as I know, attention has not been drawn. Dr. Edridge-Green and others have shown that abnormality of colour vision is much more common than is generally supposed, is very varied in character, and often unsuspected by the persons concerned. A type to which Dr. Edridge-Green has drawn attention is a partial or total lack of dark adaptation. It is well known that

when the normal eye is dark-adapted it is much more sensitive to light of short wave-length relative to that of longer wave-length than is the case under brighter conditions. This is known as the Purkinje effect, and is quite easily demonstrated in the case of a person of normal vision.

The back-glare in a normal type of fog is to some extent due to scattering, and the wave-length of the light forming the back-glare is heavily biased on the short side. This is not a matter of opinion: it can be measured instrumentally. Hence a person with a well-developed power of dark-adaptation would be particularly sensitive to this back-glare, and to such a correct filter would be of great assistance. It is readily seen that such a person in the given type of fog might pronounce nebulite to be a great success (as, indeed, many have), whereas an observer of poor dark-adaptation power testing the glass in a wet fog would say that the glass was useless, and to *him* it would be so.

Your contributor rightly drew attention to the withdrawal of the rather hastily passed resolution of the International Commission on Illumination. May I mention that in the article on the subject by a member of the staff of the National Physical Laboratory to which he refers, the writer was very guarded in his language, and quite definitely refused to dogmatize.—I am, etc.,

London, E.17, March 6th. A. H. STUART, Ph.D., B.Sc.

"Recovery after Hanging"

SIR,—I have to thank Drs. L. A. Parry, R. H. Woods, J. Gray Clegg, and J. Patrick for their interesting contributions with reference to my article. The last-named writer criticizes my statement that the "long drop" was only introduced about the year 1874.

From 1108 to 1783 all executions in London were carried out at Tyburn (close to where the Marble Arch now stands), the victims being either drawn there on a hurdle or, more usually, conveyed in a cart. The cart was drawn up under the gallows and, the noose having been adjusted, the cart was driven on, leaving the body suspended. In 1571 the gallows was extended in triangular form so as to accommodate the large number of criminals who were required to expiate their crimes on the scaffold. In this way twenty-four could be hanged at one time. In *Love's Labour's Lost* Shakespeare makes Biron say—

> "Thou mak'st the triumviry, the corner-cap of society,
> The shape of love's Tyburn, that hangs up simplicity."

In other cases, when the number was small, each victim ascended a ladder, and, the noose having been put round his neck, he was "turned off." In these cases death resulted from asphyxia. In 1783 the place of execution was removed to the front of Newgate Prison, in spite of the protestations of those residing near. In the following year a new movable gallows was made use of.

> "In the middle of this machinery, a movable platform is placed, in form of a trap-door, upon which the criminals stand. The platform is supported by two beams kept in place by bolts. The latter are released by a lever, so allowing the platform to fall, and this being much more sudden and regular than that of a cart being drawn away, has the effect of causing immediate death. . . . By practice the art is much improved, and there is no part of the world in which villains are hanged in so neat a manner, and with so little ceremony."

It would depend entirely on the hangman as to whether the victim had a long or a short drop, but it is certain that the long drop did not become general until after the year 1874. Indeed, in reading the accounts of executions, it would appear that the act of dying was often very prolonged, so indicating that asphyxiation was the real cause of death. I think that the fall of the platform merely left the victims suspended, or at best after a fall of a few inches. Indeed, we read of the hangman Calcraft (1828–74) making it almost a practice to "go below" so as to hang on to the legs of the unfortunate creature and to hasten his death.

Marwood, who was the hangman from 1874 to 1883, always gave his victims a "long drop," and referred to his predecessor as a "short-drop man." It is quite possible that Deacon Brodie may have introduced the movable platform into Edinburgh two years before his own execution in 1788.—I am, etc.,

W. G. AITCHISON ROBERTSON.

Bournemouth, March 12th.

Iodine Burns

SIR,—I agree with Dr. J. M. Morris (March 9th, p. 504), and would say that in "civilian" practice iodine should not be used for "first aid." Dry dressings are best. As a lecturer I am obliged to mention it, but I always quote instances of its dangers, of which I have seen far too many. First-aid dressings that cause irritation, blistering, etc., or staining, ought to be avoided, as they upset the patient and may also prevent the surgeon from seeing a true picture of the wound and its surrounding area.—I am, etc.,

Bacup, March 16th. J. PERCIVAL BROWN.

Medico-Legal

PATIENT'S CLAIM AGAINST DOCTOR: ALLEGED BREACH OF DUTY

In the King's Bench Division, before Mr. Justice Hilbery, an action was heard in which Mr. Kenneth Arthur Rhodes of Vereker Road, Barons Court, claimed from Dr. Stanley Rowbotham of Wimpole Street, W., damages for alleged breach of duty as a medical practitioner and for alleged wrongful and negligent treatment of his asthma with cocaine, as a result of which, plaintiff said, he became a drug addict and seriously ill. Dr. Rowbotham admitted that he administered cocaine on some occasions, but denied negligence or administration in harmful quantities. He counterclaimed for £22 7s. 6d. fees for professional services.

Mr. Eastham, K.C., for the plaintiff, said that Mr. Rhodes was treated for asthma during six weeks from June, 1933, the treatment in part consisting of the administration, on eighteen or nineteen occasions, of a nasal spray cocaine. Dr. Rowbotham also supplied the patient with cocaine in an atomizer to spray the nose, filling his atomizer on eleven occasions with cocaine solution, and on six occasions supplied cocaine solution in a small bottle holding 1/2 oz., so that the patient could administer the cocaine himself. These administrations brought on mental depression and loss of sleep, and as he then had a craving for cocaine he was advised by another doctor to enter a nursing home, where he greatly improved. Plaintiff gave evidence bearing out his counsel's statement. He said that he was not now a cocaine addict. He agreed that the cocaine sprays relieved his asthma entirely, though the same relief was given by adrenaline. Dr. Alexander Binning of Mansion House Chambers said that he saw the plaintiff in August, 1933, when his general condition was very poor; he came to the conclusion that he was at that time a cocaine addict, and advised him to go into a nursing home. He considered that in the quantities Mr. Rhodes had described the cocaine was likely to cause addiction. Asked if it did not strike him as curious that if Mr. Rhodes was a cocaine addict he should have dismissed Dr. Rowbotham, from whom he was getting supplies, he said that Mr. Rhodes had self-control and had made up his mind to overcome the addiction.

Dr. Rowbotham, in answer to Mr. Carthew, his counsel, said that he had attempted to stop the asthma spasms by spraying the nose with 10 per cent. solution of cocaine. He believed that to be the maximum strength it was safe to use in the nose. On one occasion, when he was going away, he filled the plaintiff's spray, warning him that it was not to be used indiscriminately, but only for the relief of asthma. He

had never given him a bottle containing cocaine solution, but one day he left a bottle of percaine at his house. He maintained emphatically that in the six weeks concerned he had given Mr. Rhodes a spray only on six occasions and had filled his atomizer only twice. Dr. Bedford Russell gave evidence that the general line of treatment by Dr. Rowbotham was perfectly sound; in his opinion a 10 per cent. solution was not dangerous or improper. Dr. R. D. Gillespie testified that he would not have thought it possible for plaintiff to become a cocaine addict having had cocaine administered in that way during a period of six weeks.

JUDGEMENT FOR DEFENDANT

Mr. Justice Hilbery said that even accepting the plaintiff's evidence fully, he would have thought it difficult for him to absorb in the course of a few weeks, using the atomizer given in evidence, enough cocaine from the trickle of some of the solution down the back of his throat to have created addiction. He had come unhesitatingly to the conclusion that Mr. Rhodes did not become a drug addict. He was shattered by severe asthma attacks and naturally clamoured for more of the one thing which would certainly give him relief. The judge was also satisfied that no patient could say with certainty whether he was being sprayed with cocaine or percaine solution, and the plaintiff had failed to satisfy him that he had cocaine solution sprayed on every occasion by Dr. Rowbotham. He was satisfied with Dr. Rowbotham's account of the treatment, backed as it was by his clinical notes. He accepted the other doctors' evidence that the treatment was perfectly sound and up to date. As to the bottle containing cocaine solution, it seemed strange, if the plaintiff's story were true, that Dr. Rowbotham should give away cocaine solution instead of prescribing it in the ordinary way, as he might have done.

His lordship gave judgement for Dr. Rowbotham on the claim and counter-claim, with costs.

ADULTERATED IODINE OINTMENT

On March 8th an appeal was heard at the County of London Sessions, by Messrs. F. W. Woolworth and Co., Ltd., against a conviction and fine of £15 under the Food and Drugs (Adulteration) Act for selling to a sampling officer of the Hammersmith Borough Council iodine ointment which was not of the nature, substance, and quality demanded. The earlier proceedings, in the Kensington Petty Sessional Court, were briefly reported in the *British Medical Journal* of January 19th (p. 136).

Mr. H. Glyn-Jones appeared for the respondents and Mr. Gilbert Beyfus, K.C., and Mr. E. Rider Richardson for the appellants. For the appellants it was maintained that as the formula for iodine ointment had been omitted from the current edition of the *British Pharmacopoeia* there was now no fixed standard for the ointment. They further relied on the statutory defence under Section 29 of the Act that the ointment was purchased with a written warranty as to its nature, substance, and quality.

Evidence was given by Mr. F. E. Edwards, F.I.C., the public analyst, that the "iodine ointment" in question contained only 0.06 per cent. iodine and 0.4 per cent. combined iodine, whereas the *British Pharmacopoeia 1914* and the *British Pharmaceutical Codex 1923* required such ointment to contain 4 per cent. iodine and 4 per cent. potassium iodide. The sample was therefore 100 per cent. deficient in potassium iodide and in free iodine to the extent of 98.5 per cent. Dr. J. B. Howell, the medical officer of health for the borough of Hammersmith, stated that ointment having the composition of the sample would have little medicinal value. Many people bought this ointment in the belief that it had antiseptic properties and was of use in the treatment of casual cuts, etc. Tests which he had carried out showed that as an antiseptic the ointment was practically worthless. Dr. Philip Hamill stated that ointment of the composition of the sample could not properly be described as iodine ointment. Although iodine ointment has been omitted from the current edition of the *British Pharmacopoeia*, the formulae contained in previous editions must still be regarded as the standard.

After lengthy legal argument on the question of "warranty" the bench dismissed the appeal, and Messrs. Woolworth were ordered to pay fifty guineas costs. Mr. Beyfus asked for a case to be stated for the decision of the High Court, and to this the bench agreed.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Faculty Board of Medicine has co-opted Dr. H. Morley Fletcher and Professor F. R. Fraser to serve as members until December 31st, 1935.

At a congregation held on March 15th the following medical degrees were conferred:

M.CHIR.—J. K. Monro.

M.B., B.CHIR.—G. N. Bailey, G. A. Emmerson, G. H. Jennings, R. H. Bailey, J. L. Lovibond.

B.CHIR.—*C. R. McLaughlin, *B. Rothery, *H. H. Bayley, K. L. Buxton, K. Lumsden.

* By proxy.

UNIVERSITY OF DUBLIN

TRINITY COLLEGE

At the spring commencements, held on March 13th, the following degrees were conferred:

M.B., B.CH., B.A.O.—C. M. T. Adamson, D. J. Bradley, T. A. Cunningham, A. F. J. Delany, H. M. Glover, Charlotte F. Pike, D. S. Quill, R. I. Shier, J. Sorett.

UNIVERSITY OF BIRMINGHAM

LECTURES AND DEMONSTRATIONS

A course of five William Withering Memorial Lectures will be given in the large theatre of the Medical Faculty Buildings, Edmund Street, on Thursdays, May 2nd, 9th, 16th, 23rd, and 30th, at 4 p.m. The first three lectures will be given by Professor E. Hindle, Sc.D., on "The General Properties of Viruses and Virus Infections in General," and the last two lectures by Dr. E. Weston Hurst, on "Neurotropic Virus Infections." Members of the medical profession are invited to attend.

The Ingleby Lectures, 1935, on "Acute Rheumatism and Its Results," will be given on Thursdays, June 13th and 20th, at 4 p.m., in the medical lecture theatre, by Professor K. Douglas Wilkinson.

A course of post-graduate demonstrations has been arranged by the University Clinical Board at the General Hospital, the Queen's Hospital, and the Children's Hospital, Birmingham, on Tuesdays and Fridays, from 3.30 to 5 p.m., beginning on March 26th and ending on July 9th. The course will be given by members of the medical and surgical staffs of the hospitals, and will include demonstrations on cases. The fee is £2 2s.

The Faculty of Medicine has arranged for four introductory lectures, on "Preventive Medicine in Industry," to be given by Dr. Howard E. Collier, reader in the department of industrial hygiene and medicine, in the anatomy theatre of the University, on Wednesdays, May 1st to 22nd, at 3.30 p.m. The first lecture will deal with dust and fume diseases; the second with metallic poisonings; the third with industrial dermatitis; and the fourth with industrial organic toxins.

UNIVERSITY OF MANCHESTER

Dr. Adam Davidson Macdonald has been appointed Leech Professor of Pharmacology, Materia Medica, and Therapeutics from September 29th next. Since 1928 he has been Reader in these subjects in the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A meeting of the Council was held on March 14th, with Mr. Wilfred Trotter, vice-president, in the chair.

It was decided that an Address of Congratulation should be sent to Their Majesties on the completion of the twenty-fifth year of the King's reign.

It was reported that the President, Sir Holburt Waring, had opened the new building of the Royal Australasian College of Surgeons in Melbourne on March 4th.

A special lecture will be given in the theatre of the College on May 1st by Dr. William B. Coley, consulting surgeon to the Memorial Hospital, New York.

A Diploma of Fellowship was granted to William Henry Graham Jessop, and a Diploma of Membership to Arthur Jacob Helfet.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians, to the following fifteen candidates:

H. L. Anand, E. J. Baldwin, G. D. J. Ball, A. H. Briggs, R. U. Hingorani, V. V. H. Hoakai, Alice B. Laker, T. B. Law, L. A. Lewis, F. M. Lyons, A. Mellick, J. D. Saggar, L. R. Sarin, Captain P. Shannon, I.M.S., E. Wolstein.

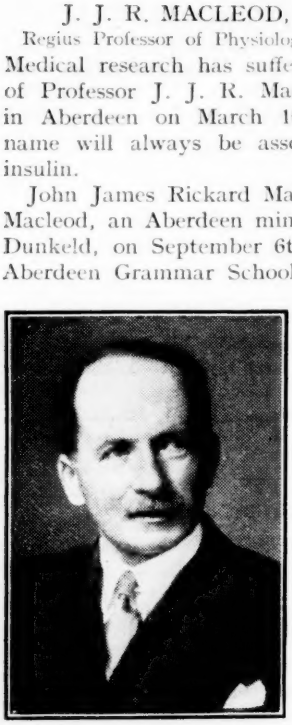
Obituary

J. J. R. MACLEOD, LL.D., F.R.C.P., F.R.S.

Regius Professor of Physiology in the University of Aberdeen

Medical research has suffered a great loss by the death of Professor J. J. R. Macleod, F.R.S., which occurred in Aberdeen on March 16th after a long illness. His name will always be associated with the discovery of insulin.

John James Rickard Macleod, son of the Rev. Robert Macleod, an Aberdeen minister, was born at Cluny, near Dunkeld, on September 6th, 1876. He was educated at Aberdeen Grammar School and Marischal College, Aberdeen, where he graduated M.B., Ch.B. with honours in 1898, and was Anderson Scholar. He also studied in Leipzig and Berlin. He served as demonstrator in physiology at the London Hospital from 1899 until 1902, when he was appointed lecturer in biochemistry and took the D.P.H. at Cambridge. In 1901 he was elected Mackinnon Research Scholar of the Royal Society, but left this post in 1903 on appointment as professor of physiology at the Western Reserve University, Cleveland, Ohio. He became professor of physiology at the University of Toronto in April, 1918, but returned in 1928 to Aberdeen, where he held the Regius Chair of Physiology until his death. In October, 1923, Professor Macleod was awarded the Nobel Prize in medicine jointly with Sir Frederick Banting for their work on insulin, and among honours and degrees he received the honorary D.Sc. from Toronto University and the honorary LL.D. from the University of Aberdeen. He was elected a Fellow of the Royal Society in 1923, and a Fellow of the Royal College of Physicians of London in 1930. He was also a corresponding member of many foreign scientific societies, and Cameron prizeman of the University of Edinburgh.



Though his main researches lay in the field of carbohydrate metabolism, Macleod did valuable work in many other fields. His first publications included an account of experiments on intracranial circulation and on caisson disease, carried out in conjunction with Sir Leonard Hill, and he retained his interest in the problem of respiration throughout his life, publishing many papers on the control of respiration between the years 1902 and 1922. The wide range of his interest is illustrated by papers on the chemistry of the carbamates and purine metabolism (1905–6), on surgical shock (1918–20), on ventilation (1920–1), and on the physiology of the intracranial circulation (1918).

His publications on carbohydrate metabolism began with a series of papers on experimental glycosuria which appeared from 1908 onwards. By 1921 he had made a thorough examination of the control of the blood sugar level in the normal and depancreatized animal, and of the part played by the liver, muscles, and pancreas in the metabolism of sugar. It was natural, therefore, when Banting came to him with his ideas on the preparation of the active principle of the pancreas in 1921 that Macleod, with his kindly willingness to listen to the theories of younger men, should place the facilities of his laboratory at Banting's disposal. The subsequent researches which gave insulin to the world are well known to all our readers. The earliest indication of this epoch-making work to reach the medical profession in this country was an editorial note headed "The Control of Glycosuria by the Islets of Langerhans" in the *British Medical Journal* of July 22nd, 1922. An authoritative summary by Macleod of the researches carried out during the previous two years in the Toronto Medical School appeared in these columns on November 4th of that year. The Toronto observations had by then placed beyond all doubt the existence of the pancreatic hormone, its origin from the Langerhans islets, the possibility of extracting and separating it in active and relatively stable condition even from the normal adult mammalian pancreas, and its efficacy in correcting the metabolic defect which causes diabetes mellitus. When Macleod and Banting received the Nobel Prize in 1923, Macleod divided his share with J. B. Collip, and Banting divided his with C. H. Best, for Best and Collip had played an important part in the early research on insulin; as Macleod said, "It was only team work that made insulin possible."

After the discovery of insulin Macleod investigated the part played by this substance in the metabolism of carbohydrate. Latterly he took up the problem of the nervous control of hepatic glycogenesis, and during the years preceding his last illness carried out important researches on the question of the existence of a "diabetic centre." Macleod wrote many textbooks and monographs on physiology in general and carbohydrate metabolism in particular; his *Physiology and Biochemistry in Modern Medicine* reached its seventh edition last year.

As a teacher Macleod was beloved by his students for his charming manner and lucid expositions of the most intricate details of physiological mechanism. As a director of research he was ever willing to listen to the ideas of his most junior assistant; then with kindly tact he would point out what he considered to be the arguments against the suggested experiments, invariably finishing, however, with the admonition, "Try the experiment yourself; it may be worth while."

Macleod will always be remembered by his many friends, associates, and pupils as one of the brightest and cheeriest of men. His optimism against all odds was a prominent feature of his life, and was conspicuous to all around him in the long months of suffering which he bore with patience and fortitude.

[The photograph reproduced is by Elliott and Fry, Ltd.]

WILLIAM JOHN ADIE, M.D.ED., F.R.C.P.

Physician to Out-patients, National Hospital for Paralysis and Epilepsy, Queen Square; Physician to Charing Cross Hospital

We record with regret the death of William John Adie on March 17th in his forty-ninth year, at the zenith of a brilliant career, which he had won by sheer merit and ability.

Adie was born in Geelong, in Australia. He came to Edinburgh to study medicine, and qualified M.B., Ch.B. in 1911. His particular interest lay in neurology, which he studied at the National Hospital, Queen Square, and at various clinics in Germany. At the outbreak of war he went to France as medical officer to the Northamptonshire Regiment, and was one of its few survivors in the retreat from Mons. He was subsequently posted to the Leicestershire Regiment, but after a time was withdrawn from the line and sent as neurological specialist to the 7th General Hospital. After the war Adie returned to London, and took the M.R.C.P. in 1919, being elected to the Fellowship in 1926, in which year he obtained the gold medal for the M.D. at Edinburgh. He was appointed to the staffs of the Royal Northern Hospital, National Hospital, Queen Square, Charing Cross Hospital, and Royal London Ophthalmic Hospital, at which he practised general medicine with neurology as his specialty. He was

secretary to the Section of Neurology and Psychological Medicine at the Annual Meeting of the British Medical Association in 1929. Being naturally endowed with a wide and sympathetic outlook on life, Adie combined most of those qualities which make an ideal consultant, and he strove to make careful clinical observation the basis of his work. With the late Dr. James Collier he wrote the section on the diseases of the nervous system in Price's *Textbook of Practical Medicine*. His original articles were clear and concise; the best known were those on narcolepsy, pyknolepsy, and somnolepsy, and he also made important observations on a clinical syndrome characterized by pseudo-Argyll Robertson pupils and absent tendon reflexes, an account of which was published in the *British Medical Journal* of May 30th, 1931. Adie was an excellent teacher, and many of his students will not forget his ability to express everything in clear and simple language. Adie was a most delightful and unselfish colleague, with many interests. His personality inspired a feeling of understanding, sympathy, and quiet confidence. In recent years his health became a source of anxiety to his many friends, but he carried on manfully in a true Christian spirit, without bitterness, rancour, or regret. To his widow, son, and daughter his colleagues extend sincere sympathy.

A former Medical Registrar of Charing Cross writes:

Adie's death at the early age of 48 will come as a profound shock to his friends and colleagues, and especially to old students, house-physicians, and registrars who had the privilege of working under him at Charing Cross Hospital. To the student his most endearing characteristic was his approachability. Adie was entirely free from affectation, and never adopted the distant manner that has been known to afflict those who are too conscious of their status as a physician on the staff of a teaching hospital. This ease of personal contact between student and mentor—having, perhaps, its origin in a colonial upbringing—was not only delightful in itself, but invaluable as a stimulus to learning. Adie was as ready to discuss and expound medical problems with a new clerk as he was with a senior physician of the hospital. He was, I think, without a rival as a teacher of clinical medicine, and had exceptional powers of observation. He himself was well aware of this, and would recount with pardonable pride the fact that he had "spotted" a man's occupation as a wine waiter by the way he walked into the out-patient room where his clinic was held. The necessity of accurate observation, of discarding irrelevant detail, of the isolation of significant facts, of clear-cut clinical pictures, was presented to the student in concise language that could leave little room for doubt. Adie had the gift of making diagnosis look easy. An able general physician as well as an expert neurologist, he always put the patient in the foreground, and only reached out for the diagnostic aids of the laboratory and *x*-ray department when these could amplify and check what he had already discovered by thorough bedside examination: he never took refuge behind, or was confused by, a mass of special reports.

His death is a great loss to the London school of medicine, and a still greater one to those who had the good fortune to know him as man and physician.

[The photograph reproduced is by Chesney, Ltd.]

JOHN WILSON LEITCH, M.B., C.M.
D.S.O.

Assistant Surgeon, Ear, Nose, and Throat Department, Glasgow Royal Infirmary

The death of Dr. Leitch only seals a loss which many medical men in the West of Scotland feel they really sustained fully three years ago. In the autumn of 1931 Dr. Leitch was struck down by paralysis, which never lifted sufficiently to enable him to resume work, and although he was bright and hopeful to the end, those of us who loved him best saw with profound regret that he would never again raise his left hand to hold an instrument.

Dr. Leitch was born in Port Glasgow, and was the son of Bailie Leitch, who was long associated with the public life of the town. He was educated at Greenock Academy and the University of Glasgow, where he in due course graduated M.A., M.B., and C.M.—the medical degrees in 1898. After qualification, Leitch was house-surgeon in the Glasgow Western Infirmary, and had some mental asylum practice in the North of England. He then joined the writer as assistant in private practice. This connexion was only broken by the advent of the Great War, before which a further link had been forged between us by his appointment as assistant surgeon in the ear department of the Glasgow Royal Infirmary. During the whole course of the war, because of continuous foreign service, Leitch never visited his home country. He served in Gallipoli, Palestine, Egypt, and ultimately in France and Belgium, and with conspicuous self-denial and devotion to duty he won the admiration of all his colleagues. He was awarded the D.S.O. and was twice mentioned in dispatches. Dr. Leitch was the victim of a special type of misfortune due to the war. During his absence the staff had changed, and a position which he could well have filled was given to another. On his return in 1919 he resumed his work as assistant at the Royal Infirmary, and he became surgeon to the Ear, Nose, and Throat Department of the Bellahouston Hospital. He was also appointed to the same department in the Glasgow Homoeopathic Hospital. He had been a member of the British Medical Association for thirty-six years, and at the Annual Meeting in Glasgow in 1922 he was secretary of the Section of Otology.

The key to Leitch's character was a three-featured one—constancy and loyalty in friendship, devotion to duty, and meticulous care in work; and the heart it opened was never again closed to him.

Dr. Leitch died in Glasgow on March 8th at the age of 61, and was buried in the cemetery of his native town on March 12th. He leaves a widow, two sons, and a daughter, to whom the sympathy of a large circle of friends goes out.

J. K. L.

OLIVER CONRAD PENRHYS EVANS, M.D.

Senior Honorary Physician, Kidderminster and District General Hospital

We regret to announce the death of Dr. O. C. P. Evans, which occurred at Kidderminster on March 13th after a short illness. He was born at Hadlow, near Tonbridge, in 1863, and was the youngest son of the late Colonel W. H. Evans. After education at Trent College he went to Kidderminster in 1880, as apprentice to Dr. Samuel Stretton. On the termination of his apprenticeship he entered St. Bartholomew's Hospital, and after taking the M.R.C.S. and L.R.C.P. diplomas became house-surgeon there. He subsequently studied at Durham University, where he took the degrees of M.D. and B.S. in 1889. He afterwards returned to Kidderminster to take up his first and only practice. Dr. Evans performed much public

service in the town, where he sat on the Town Council from 1905 to 1911, during part of which time he was chairman of its Health Committee. He did excellent work as lecturer to the local branch of the St. John Ambulance Association, and he was police surgeon for many years. He was a member of the British Medical Association, president of the Worcestershire and Herefordshire Branch (1923–4), and chairman of the Worcester Division (1926–7). He was secretary, and afterwards president, of the Kidderminster Medical Society for several years.

He was appointed a member of the honorary medical staff of the Kidderminster and District General Hospital in 1890, gave valuable and continuous service to the hospital for nearly forty-five years, and at the time of his death was the senior physician. His upright character, his genial humour, and his unfailing kindness and courtesy won for him the respect and affection of all with whom he came in contact. The funeral service at the Parish Church of St. Mary's, Kidderminster, and the following interment at the cemetery were attended by practically all the medical men of the town and near neighbourhood, and his colleagues at the hospital acted as bearers. Dr. O. C. P. Evans will be greatly missed in both public and private life, and deep sympathy is extended to his widow and daughters in their bereavement.

Mr. J. LIONEL STRETTON sends the following personal tribute. Dr. O. C. P. Evans was a colleague of mine on the staff of the Kidderminster and District General Hospital for nearly forty-five years. I always found him a most efficient and reliable officer. He took the greatest interest in the hospital, and was ever ready to render service to the patients. He will be a great loss to the hospital, but his memory should serve as an incentive to the younger men to emulate his good example. He was gifted with a considerable fund of humour, which he used with great effect in his public speeches, but he could also speak with wisdom and firmness on occasions when controversial matters were under discussion. He was very much beloved, and I can hardly believe that he ever had an enemy. Personally I had the greatest possible regard and affection for him, and I feel his loss acutely. He was an outstanding example of what is implied by the word "gentleman." Such men are of inestimable value to the hospital they serve and to the district in which they live.

SAMUEL JAMES GILFILLAN, M.B., C.M.

We regret to announce the death, after almost forty years of mental hospital work, of Dr. S. J. Gilfillan. Dr. Gilfillan was a native of Stirling and a graduate of Edinburgh University. Soon after taking his M.A. in 1890 he took up medicine, graduating M.B., C.M. in 1895. He commenced his studies in psychiatry as a resident clinical assistant at the Roxburgh District Mental Hospital, and from there proceeded as a junior assistant at Thorpe, Norwich, under Dr. David Thompson. His next move was to the L.C.C. Mental Hospital at Cane Hill in 1897, and so commenced his association with the London service, which extended over thirty-two years, and was only relinquished after a very severe illness.

During the nine years he was at Cane Hill, under Dr. (afterwards Sir James) Moody, Dr. Gilfillan assimilated knowledge of methods of administration which at a later date he put to such valuable use. His ability and personality were well recognized when he was a senior medical officer at Cane Hill, and in consequence he was on more than one occasion chosen by the committee for special duties of a more than ordinarily onerous character, and was thus definitely marked out for further promotion. On the resignation of Dr. Seward in 1911 he was made medical superintendent of Colney Hatch, the largest of the L.C.C. mental hospitals and perhaps the most widely known of mental hospitals throughout the world. Here he remained until 1930.

Dr. Gilfillan was an able and energetic physician. He was for a time lecturer in mental diseases at the North-East London Post-Graduate College, and demonstrated cases of mental disease to Charing Cross Hospital students under Dr. Mercier, who spoke very highly of his capacity. He was possessed of strong administrative ability, and under his advice and direction very many alterations were effected in Colney Hatch, and every effort was made not only to modernize, so far as possible, that historic building, but to bring its whole administration into line with modern ideas. He was faced with extraordinary difficulties during the war, owing to the withdrawal of most of his officers and the regular members of his staff for service in H.M. Forces, and as this hospital takes most of the aliens he had the added difficulties associated with the care of the many refugees whom he was called upon to receive. For his energies and successes during that period he had bestowed upon him by the King of the Belgians the decoration Chevalier de l'Ordre de Leopold, and he also received the O.B.E.

Dr. Gilfillan had a striking personality, and was of the type that is met and remembered; he was essentially independent, and rather enjoyed affecting a mysterious attitude; he was satirical in a delightful manner, had a ready wit, and an indefinable charm that gained him many friends. He was beloved by all those who had the good fortune to serve with and under him, and had a most sympathetic way in dealing with his patients. His sympathy was readily aroused when he discovered anyone in distress, and when satisfied there was need he quietly dispensed substantial acts of philanthrophy. He will be mourned by a large circle of acquaintances.

On his retirement from Colney Hatch Dr. Gilfillan accepted the appointment of resident medical superintendent at a mental hospital in Bath, and enjoyed the quieter life there. So far as can be ascertained he has died intestate and without known relatives, and we are asked to state that any information in this respect will be welcomed by the secretary, Bailbrooke House, Bathampton, Bath.

By the death, on March 8th, of ALAN ARMOUR FOTHERGILL, following a severe attack of influenzal pneumonia, the younger section of the medical profession in Edinburgh has sustained a great loss. Born in Darlington in 1898, Dr. Fothergill was descended from the Fothergills of Carr End, Wensleydale—whose medical connexion dates from the days of John Fothergill of London—of whom it used to be said in the countryside that "there was aye a Fothergill a doctor." Alan Fothergill was educated at Edinburgh Academy, enlisted in 1916 in the 8th Seaforth Highlanders, and served as a signaller in France during 1917 and 1918 until he was incapacitated by an attack of mustard gas on the Somme in July, 1918. In 1919 he entered Edinburgh University as a medical student, and became well known there as a public speaker and an enthusiastic organizer of League of Nations Union affairs. He graduated M.B., Ch.B. in 1924 and went to Manchester, where he came under the influence of his cousin, Professor W. E. Fothergill, and acted as house-surgeon at the obstetrical and gynaecological branches of St. Mary's Hospitals and later held the appointment of resident surgical officer in the gynaecological branch. He studied in London, and was house-surgeon at the Dreadnought Hospital, Greenwich, after a voyage to Japan as ship surgeon in 1926. Three years later, in 1929, he returned to Edinburgh, and became Fellow of the Royal College of Surgeons, Edinburgh. It was characteristic of him that on taking up general practice in Edinburgh in 1931—identified as he was with the Labour movement—he selected the neighbourhood of one of the largest working-class areas in which to settle. During this time

he was closely connected with the Scottish Youth Hostel movement, for which he acted as national secretary from its inception until the spring of 1934, and more recently he took an active and enthusiastic part in the organization of the Public Medical Service in Edinburgh. He had indeed a "passion for getting things done," and this was evident in his work for the many causes with which he identified himself. His strong personal interest in the welfare of his patients endeared him to them all, and many of them feel that they have lost not only a doctor but a friend.

Dr. SAMUEL EDWARDS-JONES, who died on March 8th at the age of 65, had been one of the most prominent men in Denbighshire for many years. He received his medical education in Glasgow at Anderson and St. Mungo's Colleges, and obtained the diplomas L.R.C.P., L.R.C.S.Ed., L.R.F.P.S.Glas., and L.M. in 1892. From the first he took an active interest in surgery, and he was a resident surgeon in the Glasgow Royal Infirmary. He was the author of an essay on antiseptics in relation to modern surgery, which was published in 1893, while in the following year he reported notes on the treatment of fractures, and recorded in the *British Medical Journal* an account of the successful ligature of the common carotid artery for secondary haemorrhage from the internal maxillary artery. In Wrexham he started as assistant medical officer to the Fever Hospital, and from that time became increasingly prominent in medical and municipal circles. Dr. Edwards-Jones was for some time chairman of the Health Committee of the Wrexham Town Council, and as chairman of the Denbighshire Public Health and Public Assistance Committee was largely concerned in the erection of the new hospital which has been built at a cost of £100,000. He was also medical referee of the Ministry of Pensions in Denbighshire, and an examiner for the Board of Education. He was mayor of Wrexham in 1910–11, and his great public services were recognized by the conferment upon him in 1931 of the honorary freemanship of the borough. He was a J.P. for the county, and in October, 1925, was elected a member of the county council. Dr. Edwards-Jones joined the British Medical Association in 1894. His last few years were clouded by illness, and he was compelled to retire last year from public life.

The death of Dr. J. W. RITCHIE, J.P., of Crumlin Road, Belfast, occurred on March 3rd, and has caused deep regret in a wide circle of friends and patients. He had been suffering from pneumonia, and was apparently progressing satisfactorily when he suddenly succumbed to a cardiac attack. James Whiteford Ritchie was a native of Belfast and was educated at the Methodist College and graduated M.B., B.Ch., B.A.O. in the Royal University of Ireland in 1899 from the Queen's College, Belfast. After filling various resident posts he commenced general practice on the Crumlin Road, where his skill and personality soon attracted a large number of patients. He remained the lifelong friend of them all and was ever a welcome visitor in sickness. For many years he was an active Freemason and took a deep interest in that Order. For the past ten years he was a member of the Belfast City and District Water Board and gave his services on many committees of the Trust, in addition to being vice-chairman for a period. Some time ago he was appointed to the magistracy of the City and fulfilled the duties of this office with the grace and acceptance which endeared him to so many. To his widow and children, as well as his cousin Dr. H. J. Ritchie, sincere sympathy is tendered in their bereavement.

The following well-known foreign medical men have recently died: Hofrat Professor NORBERT VON ORTNER, formerly head of the Second University Clinic at Vienna, aged 70; Professor LEONHARD JORES, emeritus director of the Kiel Pathological Institute; Dr. W. MURK JANSEN of Leyden, the eminent orthopaedic surgeon, aged 67; and Dr. H. HORNE, who was recently appointed professor of racial science at Halle.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The Matrimonial Causes (Amended Procedure) Bill was read a third time and passed in the House of Lords on March 15th.

The House of Commons, during the past week, has discussed the Navy, Army, and Air Force Estimates.

In the House of Lords the Criminal Lunatics (Scotland) Bill, which makes provision for the establishment of a criminal lunatic asylum in Scotland, was read a second time on March 19th, on the motion of Lord Strathcona.

Also in the House of Lords, on March 19th, the Increase of Rent and Mortgage Interest (Restrictions) Bill and the Post Office (Amendment) Bill were read a second time.

B.M.A. Committee on Alcohol and Road Accidents

On March 18th Mr. HORE-BELISHA, replying to Mr. Rhys Davies, said that he had asked the British Medical Association whether it could give him any information on the question of the connexion between the consumption of alcoholic liquor and road accidents. The Association had informed him that it had appointed a committee, consisting of fifteen members, to examine the question. He hoped that Mr. Davies would agree that all matters in connexion with this inquiry might safely be left in its responsible discretion.

Medical Men in the Army

In the House of Commons, on March 18th, the Army Estimates were presented by Mr. HACKING. He said that this year they were higher by about £4,000,000. Under Vote 3 the House was asked to provide £950,000 net for the cost of the medical services. No one would dispute the necessity for the provision of medical attention to the troops. Few realized that the Royal Army Medical Corps had its special problems in peace no less than in war. The distribution of troops in oversea garrisons, under widely varying geographic and climatic conditions, must call for specialized medical knowledge, which might not be attainable in the United Kingdom. Behind the ordinary day-to-day medical attention proceeded careful research into medical problems peculiar to the Army. Often this research was of immense value to the civil population, as, for example, in the case of Malta fever, which for centuries was an endemic disease in Malta. The discovery of the cause of this disease and the means of preventing its occurrence, which had been completely successful in the Army, was entirely due to the work of the Army Medical Corps. Important research was proceeding now into anti-typhoid inoculation. For some years there had been a disconcerting lack of candidates for commissions in the R.A.M.C. This, no doubt, was partly due to financial considerations, and these had been receiving attention. Conditions of service had already been materially improved; promotion had been hastened; and the period of service necessary to qualify for a gratuity on retirement had been reduced. It was now possible for an officer to take a short-service commission for five years and be awarded £1,000 gratuity at the end of that period if he was not then appointed to a permanent commission. The service should be attractive to young men who had qualified. The life was interesting, and there was plenty of opportunity for specialization for those who were keen and desirous of pursuing their medical studies and research. He was confident that if the work of this corps were much better known there would be a much wider field of selection.

Sir A. WILSON drew attention to the deplorable state of many barracks abroad, and said that the question of the water supply at home should be dealt with. There was also great need of further maternal and child welfare among the soldiers' wives and children. Dental care, particularly in foreign places, lagged behind that available in civil life. There had been practically no antimalarial work done in certain stations, owing to financial stringency, with the result that all the good work in recent years was of no avail. In India we were spending about 11½d. a head on antimalarial work compared

with £1 15s. 4d. a head in the Panama Canal zone. The result was that malaria for 1933 was much worse than before, and in spite of many other efforts to improve the Army it remained the principal scourge.

Sir FRANCIS FREMANTLE said that the question of reorganizing the entrants for the R.A.M.C. had perturbed him very much. In May, 1931, the late Government appointed the Warren Fisher Committee to inquire into the recruitment of medical officers for the three Defence Services. The committee had to consider the shortage of officers and nurses in the medical and dental branches of the Service. It reported in July, 1933, and last year the House was told that the report was under consideration. Now they were able to congratulate the Government on having put into force many of the recommendations. The main recommendation was that as it was almost impossible to get young medical officers to enter these Services for life after leaving their hospital training, the proper thing to do was to begin a series of short-service commissions for five years, and that at the end of the five years those who had done best should be selected for permanent commissions, and those not selected should be retired with a gratuity of £1,000. This recommendation had been put into force, and the result was that since June of last year forty new medical men had been taken into the Army Medical Service, the largest number since the war. That seemed satisfactory, but they had to consider the effect on the cadres of the higher ranks. The difficulty was how to get permanent promotion carried through. The recommendation was to make promotion to the higher branches of the Service, and these had been increased to twenty-five in one case and twenty-one in another, while special posts, and the most important, had been increased from 113 to 155. These were matters which gave employment in professional work and had attracted men into the Service. At the same time the total number of men employed was fewer, and the actual expenditure reduced. He presumed this had been effected by a better distribution of duties. The reduction was considerable. The actual number of men had been reduced from 539 last year to 479 this year. It meant a retirement in the senior grades, and so they had a reduction of sixty-nine in the total number of medical officers. That seemed to him to be serious, and he hoped the Financial Secretary would deal with it in his reply. He also hoped the Financial Secretary would pay attention to the fact that the senior officers in the Corps who had served well had not been touched by these promotions and changes. They were badly hit, and felt a great injustice. He referred specially to officers of twenty-two years' service, who did not come under the reforms. The opinion of those who knew best was that the short-service commission arrangement was of doubtful value. The senior officers naturally did not like the idea of young officers coming in for five years only, and were opposed to it. It was significant to note the opinion in the Air Force, where the same system had been adopted. He understood there had been such a brilliant entry of young medical officers that when the end of the short period of the commission was reached it would be difficult to choose who was to remain in the Force, because all were so good. Those in the Air Force considered that in the Army the same thing would happen. Let them hope it would be so, and that they would get a fine permanent cadre to choose from at the end. The Territorial Army Medical Service had not been considered as yet. Here they had a very serious impairment of strength. If they compared strength with establishment they found that there was a shortage of something like one-fourth of the establishment, and a shortage still more of units. A division, when it went to war, had three field ambulances for its twelve battalions. That number was cut down in the Territorial Army to one field ambulance. Anyone who knew the organization of a division knew that one field ambulance went to a brigade. Therefore, in the Territorial organization, they had two brigades being trained in peace time without any field ambulance at all. Another shortage had had a serious effect. Last year one of the Artillery brigades had to do its firing under the new arrangements deprived of a medical officer. The rules rightly laid down that no shooting with Service ammunition should be allowed without a medical officer being present. The brigade had to scour the county for a civilian to come while they did their shooting. A civilian could not always be found, and when found was as expensive as to keep as a regimental medical officer. The regimental medical officer had been there, but had been turned off because the establishment was cut down. He hoped that that particular incident had been brought to the notice of the War Office, and that it would receive further attention.

The House then went into committee, and the various votes were agreed to.

Medical Men in Ceylon

Replying to Mr. T. Williams, on March 19th, Sir P. CUNLIFFE-LISTER said that in 1933, the latest year for which figures were available, the estimated population of the municipality of Colombo was 294,420. According to the *Medical Register* for the same year the number of medical practitioners registered in Colombo was 182. He was not in a position to say what actual percentage of these doctors or other practitioners registered outside Colombo actually practised within the municipality. Sir P. Cunliffe-Lister also told Mr. Williams that the latest figures available showed the number of medical practitioners registered in Ceylon as 811. There was no other town of comparable size in the island. In addition to private practitioners, the authorized establishment of the Government medical service was 351 medical officers and medical officers of health, and 683 apothecaries and sanitary inspectors, but it would be difficult to say precisely what proportion of these officers devoted their services to country areas. In 1933, outside Colombo, there were eighty-nine Government and eighty-four estate hospitals, the number of hospital beds provided by the Government being approximately 2 per 1,000 of population. In addition, 626 central and branch dispensaries and visiting stations were maintained by the Government and 727 dispensaries by estates.

Anaesthetics in Childbirth

Sir HILTON YOUNG, on March 19th, informed Sir W. Ray that he had noted with interest the experiments which had been carried out in many voluntary maternity hospitals and in certain L.C.C. hospitals, and at the Wellhouse Hospital, Barnet, with a view to finding some safe and satisfactory method of relieving the pain of childbirth. He was advised that medical opinion was not unanimous as to the safety and desirability of administering anaesthetics in all cases, and he would not be justified in making a general recommendation as to the adoption of particular clinical and therapeutic methods, which must remain within the discretion of the medical officers responsible for the care of their patients. He had no doubt that the medical officers of hospitals provided by local authorities were, in common with the medical profession generally, fully alive to the importance of continued investigation of this subject, and the visits of his medical officers to these hospitals afforded opportunities of discussing the arrangements for inducing anaesthesia in suitable cases.

Driving Tests.—On March 18th Dr. O'DONOVAN asked the Minister of Transport whether instructions had been given to his examiners to note if candidates for driving licences could distinguish red from green lights with facility. Mr. HORE-BELISHA said that an examiner was not required to subject a candidate to a specific test of colour vision, but under the regulations he must be satisfied that the candidate was able to act correctly on all signals given by traffic signs.

Diphtheria and Tonsillitis.—On March 19th Mr. GROVES asked the Minister of Health whether any record was kept by the medical superintendent of the Birmingham Infectious Diseases Hospital to show how many of the children sent in as cases of diphtheria and subsequently diagnosed as tonsillitis had previously been immunized. Sir HILTON YOUNG circulated the following reply, the information being supplied by the local authority:

Year	Total Number of Suspected Cases of Diphtheria Admitted to Hospital.	Number of Cases which proved not to be Diphtheria	Number of cases in Column 2 Previously Immunized and now Diagnosed as Tonsillitis.
1931	1,728	690	9
1932	1,156	609	10
1933	788	441	11

Figures are not yet available in respect of the year 1934. It should be noted that 50 per cent. of the cases quoted in Column 3 were also diagnosed as tonsillitis

Medical News

The ninety-third half-yearly dinner of the Aberdeen University Club, London, will be held at the Café Royal, on Thursday, April 11th, at 7.30 p.m., followed by dancing. Principal Sir George Adam Smith will preside. Honorary secretary's address, 16, Tregunter Road, S.W.10.

Lord Reading will open the Bernhard Baron Outpatient Department of the Poplar Hospital for Accidents on Friday, March 29th, at 2.15 p.m.

The annual meeting of the Mental After-Care Association will be held at the Incorporated Accountants Hall, Victoria Embankment, S.W., to-day (Friday), March 22nd, at 3.15 p.m., with Lord Wakefield in the chair. The speakers will include Sir Hubert Bond, Sir Walter Langdon-Brown, Dr. W. G. Masefield, Dr. Reginald Worth, and Dr. H. Yellowlees.

A meeting of the medical section of the British Psychological Society will be held at the House of the Medical Society of London, 11, Chandos Street, Cavendish Square, W.1, on Wednesday, March 27th, at 8.30 p.m., when a paper entitled "Sex Regulation and Culture" will be read by Mr. J. D. Unwin, Ph.D.

A meeting of the Medico-Legal Society will be held at 11, Chandos Street, W., on Thursday, March 28th, at 8.30 p.m., when a paper will be read by Mr. Albert Crew on "The Reformation of the Old Bailey." A discussion will follow.

The Fellowship of Medicine (1, Wimpole Street, W.) announces that a week-end course in medicine and surgery will be given at Southend General Hospital on March 30th and 31st. Other courses include: infants' diseases, at the Infants Hospital, from April 1st to 13th (afternoons); ophthalmology, at the Royal Eye Hospital, during same period; proctology, at St. Mark's Hospital, from April 8th to 13th; psychological medicine, at Maudsley Hospital, from April 23rd to May 31st; dermatology, at St. John's Hospital, April 29th to June 1st; medicine, surgery, and gynaecology, at Royal Waterloo Hospital, from April 29th to May 11th. A demonstration, suitable for M.R.C.P. candidates, on the fundus oculi will be given at West End Hospital for Nervous Diseases (in-patient department) on April 2nd at 8.30 p.m. Detailed syllabuses of all courses will be sent on application.

In order to allow members of the Congress of Oto-neuro-ophthalmology, which is to be held at Nice from April 15th to 18th, to visit Morocco, a cruiser will leave Marseilles on April 20th. The tour is also open to members of the Congress of Tuberculosis, which will be held at Marseilles at the same date. Further information can be obtained from the Office Central des Congrès, 8, Avenue de l'Opéra, Paris.

On March 15th Mr. Lewis Silkin, chairman of the Housing and Public Health Committee of the London County Council, opened the new isolation block which has recently been erected by the Council as an extension of its Western Hospital (for infectious diseases), Fulham. The new block is two stories high and has accommodation for seventy-seven cases.

Two Sir Milsom Rees scholarships for sons of medical practitioners of £100 each to Port Regis Preparatory School, Broadstairs, have been awarded to C. Wigram, son of Mr. N. G. Wigram, F.R.C.S., and to A. K. Hendry, son of Dr. J. A. Hendry.

The March issue of *The Practitioner* consists for the most part of a symposium on the anaemias.

Owing to financial difficulties the British Hospital at Constantinople had to close on December 31st, 1934.

Postage stamps have recently been issued in Spain bearing the likeness of the late Professor Ramon y Cajal.

A corps of aviation nurses has been founded in France under the direction of Mme Marie Marvinot by the co-operation of the French military authorities with the public health service.

The Lancashire Mental Hospitals Board has approved a scheme for providing a new institution for 2,000 mental defectives and a new hospital for 1,000 mental patients.

There has recently been an outbreak of bubonic plague in the northern part of the Orange Free State. Thirty deaths have occurred, four of which were among Europeans. Rats are being attacked with poison gas.

Dr. Emile Sergent has been elected President of the Société Médicale des Hôpitaux de Paris.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

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Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

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QUERIES AND ANSWERS

Hypertrichosis

"BEARDED" (London, W.1) requests suggestions for routine treatment of profuse hair on a woman patient's chin. The patient, aged, refuses any treatment likely to cause pain, cannot afford radical treatment by electricity, but is very worried by the disfigurement.

⁂ Why not use a safety razor?

Hyperidrosis

"INQUIRER" asks for suggestions in treating a patient who has profuse sweatings on the least exertion—for example, when merely walking about the house. She has had the advice of two consultants, and the usual remedies for the control of perspiration have been tried in vain.

Diphtheria Carriers

Mr. JOHN R. SCOTT, Ph.C. (London, S.W.11), writes: In your issue of February 9th (p. 288) "P. G. D." asks for a treatment for a diphtheria carrier. He may be interested in the treatment given in *Presse Médicale* (March 7th, 1934), which appeared in abstract in *L'Union Pharmaceutique* (July, 1934, p. 200). It is, briefly, as follows. Every carrier should give meticulous care to the hygiene of the mouth, and a gargle containing hydrogen peroxide should be used several times a day. Once or twice daily a small quantity of the following ointment should be introduced into the nostrils: ichthyol; hydrarg. ammon., ana 2 grams; zinci oxid., 10 grams; paraff. molle, q.s. ad 100 grams. When this ointment is used no iodine or iodides should be given. The treatment should not terminate until half a dozen swabs, each taken at an interval of four or five days, are negative. In refractory cases, if, after three or four negative swabs, there should be a positive one, the following should be used: sozoiodol-sodium, 10; soft paraffin, 100. A small quantity to be inserted into the nostrils, and paint the throat with an application consisting of sozoiodol-sodium, 10, glycerin, 100. There is a statement to the effect that in carriers the organism is found, not in the throat, but often in the nasal cavities, and the author suggested a bacteriological examination of smears

from the nasal mucous membrane and pharynx. These should be taken in the morning before any rhino-pharyngeal antiseptic is applied. The author stated that the classic treatment was to use diphtheria antitoxin in treatment of carriers, but explains its lack of success in that it is "antitoxique" rather than "antimicrobien," and it is for this reason that chemical disinfectants should be used locally against the micro-organisms and on the tissues which harbour them. As I am not a medical practitioner I cannot pretend to judge the efficiency of such treatment or the hypothesis underlying its principles. The abstract states that with the above treatment patients rarely remain carriers for more than two or three months; and if your correspondent would like to borrow *L'Union Pharmaceutique*, wherein the abstract appears (in French), I should be pleased to lend it.

Congenital Neurosyphilis

Dr. ERIC A. FREYWIRTH (London, S.E.17) writes in reply to "G." (March 9th, p. 513): I have good reasons to believe that the fits the boy is suffering from are the manifestations of a commencing juvenile G.P.I. His age is strongly suggestive, being 15 years, which is the usual incubation period of this disease after syphilitic infection in the adult, and there is no reason to believe that it should be otherwise where the infection is acquired in the uterus. A Lange test in the cerebro-spinal fluid may help, or, again, it may not. Previous treatment with arsenicals does not, in my opinion, make the appearance of G.P.I. less likely if only commenced when the disease is already well advanced. I suggest—if the general condition permits—that the boy be submitted to a full course of malaria therapy, followed by quinine and intrathecal treatment with salvarsanized serum. This treatment, if administered carefully, does not seem to be tolerated badly, and I gave as many as twelve such injections in a case of tabes with very satisfactory results. Unless this treatment can be carried out I am afraid there is little hope of keeping the boy from becoming an inmate of a mental hospital within one to two years.

Income Tax

Change in Partnership

"H. S." puts the following case. A. and B. were in partnership up to June 30th, 1934, on a ratio of fifteen-twenty-fourths to nine-twenty-fourths; from that date B. took over an additional six-twenty-fourths, A. retired, and C. came in on a nine-twenty-fourths basis. A. declines to join in a request to have the practice regarded as having ceased and restarted at June 30th. Are B. and C. bound by the assessment on the previous year's basis, notwithstanding the prospect of reduced earnings?

*** Yes. A firm is chargeable to tax as a separate entity, and unless A. joins in an election to have the practice regarded as having ceased it must be regarded as continuing, in which case the previous year's basis applies, and for the last three-quarters of the financial year 1934–5 B. and C. are liable to account for tax on their respective shares of the assessment based on the 1933 earnings.

Appointment—Emoluments

"G. C. B." holds an appointment receiving a salary of £200 per annum and an additional £100 per annum in lieu of board and lodging. What is the tax due?

*** "G. C. B." is liable to tax on the whole £300, the tax due being £300 less £60 (earned income relief) and £100 (personal allowance)—that is, £140 at 2s. 3d. = £15 15s. If the board and lodging were supplied in kind the value would not be assessable.

Allowance for Services of Wife

"A. B."—a doctor's wife—inquires whether any claim, and if so how much, can be made in respect of her work in connexion with the practice. An indoor assistant is sometimes employed.

*** It is impossible to suggest any particular sum as correct, as it must depend on the circumstances of each case. If, in fact, a wife is paid—merely nominal payment is not enough—a reasonable amount for assisting her husband in his professional work that amount can be claimed as a legitimate expense of the practice. Usually this restricts the deduction to payments to a wife for keeping the books, making out the accounts, etc., but if some reasonable payment is made for the additional domestic work entailed by the boarding of an assistant, such a payment would also seem to be a proper subject of claim.

LETTERS, NOTES, ETC.

The Pulse Rate in Tuberculosis

Dr. R. S. CAREY (Bristol) writes: Apropos the rather delightful paper by Dr. W. Burton Wood on the early diagnosis of tuberculosis, in the *Journal* of February 16th (p. 294), I was surprised to find that he did not refer to the cardiac signs. I believe that one of the earliest signs of tuberculosis is a raised pulse rate. In many cases where a "lightning diagnosis" of tuberculosis has been suggested by the appearance of the patient, a slow or moderate pulse rate has often caused me to be cautious, and I cannot remember a case where I have had to regret my caution. On the other hand, where I have found a persistently raised pulse rate in the absence of other symptoms I have, regrettably, often found that tuberculosis develops. The optimistic patient with a rapid pulse rate who "does not feel quite well" calls for a very guarded prognosis. The Elizabethan lady that Dr. Burton Wood depicts may be perfectly safe if her pulse rate is low. In my experience also, the area of cardiac dullness is generally small in cases of early tuberculosis, but I have no explanation of this.

St. Dunstan's

The twentieth anniversary of the foundation of St. Dunstan's for war-blinded soldiers, sailors, and airmen falls on Tuesday next, March 26th. It was from the house called "St. Dunstan's," in the Outer Circle of Regent's Park, that it took its name, and it was there, on March 26th, 1915, that the late Sir Arthur Pearson began its work with sixteen war-blinded patients. Since then the numbers have risen to nearly 2,000, while new cases continue to come in. During the last three years there have been nearly 100 new cases of war blindness. As a result of the work of the welfare department, originally started by the present chairman of St. Dunstan's, Sir Ian Fraser, the very great majority of these blinded ex-service men are now installed in their own homes, carrying on the occupations they have learned since being blinded. In 1920 St. Dunstan's moved to quarters in the Inner Circle of Regent's Park, where its administrative headquarters are still housed. A number of "bed" cases are now looked after at St. Dunstan's at Brighton, which is also used as a convalescent and holiday home.

Disclaimer

Dr. E. D. HAYES (The Mental Hospital, Berry Wood, Northampton) writes: I am the author, jointly with Dr. Alexander Cannon, of two purely professional books dealing with psychiatry and neurology, published by Heinemann in 1932 and 1934. My co-author is, as is well known, the sole author of several psychic works, which have attracted a good deal of attention among the general public, and these works have had inserted therein, without my knowledge, announcements relative to the joint professional works in question. I desire to make it perfectly clear that had I known that references to the joint works referred to were intended by my co-author to be inserted in his psychic books I should have objected to this; I have intimated my disapproval to Dr. Cannon, and requested his assurance that there shall be no further allusion to the joint work in any further editions of the psychic books. I should like to state, in fairness to my co-author, Dr. Cannon, that on the matter being brought to his notice he unreservedly agreed to comply with my wishes.

Corrigenda

Owing to an error the word per-arterial was printed instead of par-arterial under the heading of "Pathologist's Report" in Dr. James Grant's paper on "Atheroma of Coronary Artery and Myocardial Fibrosis," published in the *Journal* of February 23rd.

In the annotation headed "What is a Secret Remedy?" (March 9th, p. 481) "trihydroxybutane" should have read "trihydroxypropane," in the tenth line from bottom of second column.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 50, 51, 52, 53, 54, 55, 58, and 59 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 56 and 57.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 116.